

DEPARTMENT OF THE ARMY  
U. S. ARMY ABERDEEN PROVING GROUND  
ABERDEEN PROVING GROUND, MARYLAND 21005-5001

APG Regulation  
No. 420-1

11 September 2001

Directorate of Safety, Health and Environment  
**FIRE AND EMERGENCY SERVICES PROGRAM**

Organizations supplementing this regulation which exceeds minimum requirements, or that prepare Standing Operating Procedures (SOP's) relating to the fire prevention and protection program, will provide one copy of each supplement and/or SOP to the Fire & Emergency Services Division, ATTN: AMSSB-GSH-F.

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\* This regulation supersedes APG Regulation 420-1, 2 September 1986

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**(AMSSB-GSH-F)**

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## CHAPTER 1

### ADMINISTRATION

**1-1. PURPOSE.** The purpose of this regulation is to establish policies, responsibilities, and procedures including requirements for implementing the Aberdeen Proving Ground (APG) Fire and Emergency Services Program.

**1-2. SCOPE.** This regulation applies to all activities located at APG to include those who have entered into a support agreement with the U.S. Army Garrison, Aberdeen Proving Ground (USAGAPG). It also applies to all military, civilian and contractors' employees assigned to quarters, working or visiting Aberdeen Proving Ground. When this regulation conflicts with more stringent requirements outlined by tenant regulation, the more stringent criteria will apply.

**1-3. INTENT.** The intent of this regulation is to prescribe minimum requirements necessary to establish a reasonable level of safety for Fire Fighters and the general population of APG and to protect property from the hazards created by fire and explosion. It also recognizes special needs for that portion of the APG population who are challenged either physically, emotionally or mentally.

**1-4. STANDARDS.** The minimum standards for the fire prevention and protection program at APG are contained in this regulation and such other nationally recognized fire codes, standards, and regulations as referenced herein.

**1-4.1.** Referenced publications are available for review at the Fire Chief's Office, Aberdeen fire station, and the Edgewood fire station.

**1-4.2.** Codes, standards, publications and regulations not referenced herein but given the power of regulation by higher authority shall be applicable.

**1-5. AUTHORITY.** The Fire Chief or his representatives shall be the Authority Having Jurisdiction (AHJ) with regard to the interpretation of national fire codes, standards, military regulations, Code of Federal Regulations and their application to fire prevention and protection at APG.

**1-5.1.** This regulation has the authority of law on the installation as an extension of AR 420-90, Fire prevention and protection. Portions of the Occupational Safety and Health Act of 1970 as amended, Public Law 93-498 Federal Fire Prevention and Control Act of 1974, Americans with Disabilities Act of 1990 as amended, and other applicable regulations have been incorporated into this regulation.

**1-5.2.** The fire department personnel are authorized to suspend operations in the performance of their fire prevention and protection duties when the operations are such that continuation may be deemed to be an imminent hazard. The fire chief and the installation safety office will be notified immediately.

**1-5.3.** No military, civilian or contractor's employee has the authority to interfere with the Fire and Emergency Services Division while engaging in a fire, rescue, hazardous material incident, hazardous waste operation, chemical or nuclear response, motor vehicle accidents with injuries, explosions, confined space rescue, conducting fire inspections or other essential duties.

#### **1-6. RESPONSIBILITIES.**

**1-6.1. Director of Safety Health and Environment will:** serve as Fire Marshal for the installation.

**1-6.1.1.** Be responsible to the Commander of APG for the organization and coordination of fire prevention and protection programs.

**1-6.2. The Fire Chief will:**

**1-6.2.1.** Be responsible for the organization and coordination of Fire Prevention and Protection Programs.

**1-6.2.2.** Enter into Mutual Aid Agreement(s) with surrounding communities as appropriate.

**1-6.2.3.** Maintain records of building inspections and other information pertinent to fire prevention and protection.

**1-6.2.4.** Maintain a current list of designated Area Fire Marshals.

**1-6.2.5.** Provide technical advise and conduct training programs for Area Fire Marshals in performance of monthly fire prevention of buildings, facilities, areas, etc. Provide updated information on codes and standards annually as requested by Area Fire Marshals.

**1-6.2.6.** Conduct periodic matrix inspections and fire prevention inspections of buildings, structures, facilities, fire protection systems, etc.

**1-6.2.7.** Inspect and test automatic sprinkler systems, fire suppression systems, automatic and manual fire alarm systems and battery-operated emergency lighting systems, and other life safety equipment installed in buildings at APG.

**1-6.2.8.** Determine Occupancy Classification for all buildings, structures and facilities at APG.

**1-6.2.9.** Supply, survey, install and maintain fire extinguishers in buildings. Recharge and hydrostatic test all types of authorized fire extinguishers.

**1-6.2.10.** Conduct all fire fighting activities at APG . Conduct rescue operations where persons are endangered.

**1-6.2.11.** Provide ambulance service on post and medical assistance off post when required.

**1-6.2.12.** Provide support to chemical, biological, and nuclear accidents and incidents.

**1-6.2.13.** Provide support to safeguard unexploded ordnance situations.

**1-6.2.14.** Perform fire investigations and investigate unusual incidents.

**1-6.2.15.** Review standing operating procedures for hazardous operations where fire safety is paramount.

**1-6.2.16.** Respond to and take appropriate actions to control, contain and alleviate hazards at hazardous material incidents.

**1-6.2.17.** Test fire hydrants on an annual basis in the Aberdeen area by contractors, and in the Edgewood area by members of the Fire and Emergency Services Division. Hydrants will be adequately maintained by the contractor in the Aberdeen area and by the Directorate of Installation Operations (DIO) in the Edgewood area.

**1-6.2.18.** Review all new construction, alteration and modification projects to insure adequate compliance to current fire codes and standards.

**1-6.2.19.** Submit requirements for alarm, detection and suppression systems.

**1-6.2.20.** Submit requirements for repairs, maintenance, construction and alterations as needed to provide adequate fire protection.

**1-6.2.21.** Provide and maintain an effective fire prevention program.

**1-6.2.22.** Maintain training programs in fire prevention and fire protection.

**1-6.2.23.** Take all necessary action to suspend operation involving imminent danger.

**1-6.2.24.** Provide guidelines in establishing policy for outdoor concerts and other assemblies.

**1-6.2.25.** Review policies and procedures pertaining to Emergency Preparedness.

**1-6.3. Provost Marshal will:**

**1-6.3.1.** Establish fire lines, control traffic around a fire, rescue and accident scene. Prevent pilfering and crowd control as requested by fire department Incident Commander at the scene of an emergency.

**1-6.3.2.** Provide security to buildings or areas to prevent unauthorized entry after the termination of a fire or like emergencies until the building or area can be boarded up, locked or permanently secured.

**1-6.3.3.** Cite violators who park in fire lanes, by fire hydrants and block or obstruct egress and ingress from buildings or structures.

**1-6.3.4.** Assist the fire department during outdoor concerts so that access and egress routes determined by the fire department will be maintained so that crowd management, security, and emergency medical personnel shall be able to move without undue hindrance at any time to any individual.

**1-6.4. Chief of Safety Offices will:**

**1-6.4.1.** Take appropriate action to assist in alleviating imminent hazards when requested.

**1-6.4.2.** Assist in issuing flame permits in areas, vehicles or containers that contain or have contained explosives.

**1-6.4.3.** Incorporate serious fire code violations into the installation abatement program. Assist in promoting compliance to fire code violations as outlined in Occupational Safety and Health Act standards.

**1-6.5. Commander, Kirk U.S. Army Health Clinic will:**

**1-6.5.1.** Provide additional medical assistance at fires, hazardous material incidents and other emergencies as deemed necessary by the fire department Incident Commander.

**1-6.6. Director of Installation Operations (DIO) and Utility Company Contractors will:**

**1-6.6.1.** Ensure quick response to emergencies and incidents when requested by the senior fire officer.

**1-6.6.2.** Provide material and labor to secure buildings or structures after a fire or other incident.

**1-6.6.3.** Provide quick assistance in snow removal from entrances to fire stations and provide safe passage to emergency locations.

**1-6.6.4** Provide building numbers for every building and structure on this installation. The buildings and structures shall be clearly marked with the name or building number as soon as the building or structure is occupied.

**1-6.6.5.** Will provide a current listing of all buildings that are inactive, condemned, or scheduled for demolition to the Fire & Emergency Services Division.

**1-6.7. Commanders, Directors, Heads of Activities and Contractors will:**

**1-6.7.1.** Appoint an Area Fire Marshal annually on 1 October and when required by change in command or other personnel. The appointment must be made in writing, and a copy of the appointment letter will be forwarded to the Fire Chief's Office, ATTN: AMSSB-GSH-F. The appointment must include the name, rank or grade, telephone number and the building location of the Area Fire Marshal. Only one Area Fire Marshal will be appointed for each organization.

**1-6.7.2.** Review the organization's fire prevention and protection program, assuring its effectiveness and agreement with current regulations and practices.

**1-6.7.3.** Provide ample time to the Area Fire Marshal for implementing and evaluating the outcome of the fire prevention and protection program within their organization.

**1-6.7.4.** Assure that any plans for alteration, renovation of any building, structure or facility are forwarded to the Fire Chief's Office for review of compliance with current fire codes, standards and regulations.

**1-6.7.5.** Support and promote seasonal fire prevention programs conducted by the Fire and Emergency Services Division, DSHE.

**1-6.7.6.** Make recommendations to the Fire Chief on ways to improve the installation fire prevention program.

**1-6.8. Area Fire Marshal will:**

**1-6.8.1.** Appoint building, section or unit fire marshals as necessary to assure that assigned duties are carried out.

**1-6.8.2.** Review monthly fire prevention inspections of all buildings or facilities assigned to the organization.

**1-6.8.3.** Insure that fire inspection reports (EAP Form 1023) are forwarded to the fire chief's office, ATTN: AMSSB-GSH-F, within ten days of the end of each month.

**1-6.8.4.** Maintain a list of discrepancies and action taken to eliminate fire hazards.

**1-6.8.5.** Coordinate with the fire department to schedule fire drills as required. Support the fire department in scheduling special activities for the organization during National Fire Prevention Week and other seasonal campaigns.

**1-6.8.6.** Assure that fire marshals and fire guards are trained to perform their duties.

**1-6.8.7.** Enforce fire regulations within the perspective organization.

**1-6.8.8.** Maintain a list of all fire marshals and building custodians for buildings or facilities assigned to the organization. The list must include key location for all buildings, portion of buildings and facilities for during and after duty hours. This list will be forwarded to the fire chief's office for emergency notification. This list must be updated annually or when there is a change of fire marshal or building custodians.



**1-6.8.9.** Maintain a list of names of physically challenged employees within their organization to include their duty location and hours of operations. This list must be submitted to the fire chief's office annually or as changes occur.

**1-6.8.10.** Insure that a high standard of cleanliness and good housekeeping is maintained in and around building at all times.

**1-6.8.11.** Insure that evacuation procedures are prepared, posted and made available to every employee of their organization.

**1-6.8.12.** Maintain a list of outstanding service and job orders, perform periodic follow up on the disposition of work orders dealing with fire and safety hazards.

**1-6.8.13.** Make recommendations to the Fire Chief on ways to improve the fire safety program.

**1-6.9. Supervisors/Managers will:**

**1-6.9.1.** Assure that newly-assigned personnel have been briefed on the fire evacuation procedures to include location of fire extinguishers, proper use of fire extinguishers, methods of reporting fires and other emergency preparedness.

**1-6.9.2.** Ensure that refresher training or orientation is given annually to all employees in fire safety.

**1-6.9.3.** Provide authority to the building fire marshal to enforce fire regulations and make corrections to eliminate fire hazards.

**1-6.10. Building Custodians will:**

**1-6.10.1.** Notify the fire department immediately when heating of any building has been discontinued during the heating season.

**1-6.10.2.** Assure that Building Assignment Record (EAP Form 1076) is placed on the front entrance of the building or the portion of the building for which he/she is responsible. It is the responsibility of the custodian to periodically update the information on the card. The card must be placed where it can be read from outside of the building. Ensure the following information is included on the custodian card:

(a) Building number or portion of building  
Example - ( Building 502 Bays 1 through 6).

(b) Organization

(c) Name, duty hour location of responsible person, duty telephone number, and home telephone number for both primary and alternate custodians. Home telephone number is required for emergency response to buildings after duty hours. A list of key locations must be provided during duty hours for buildings that are not normally occupied.

**Exception:** Buildings that deal in currency, weapons or explosives, will not display the custodian information. However, the custodian must provide the information to the fire department and the APG Police Department. The Building Assignment Record (EAP Form 1076) must still be displayed on the building. The only information that will be placed on the card is: **In the event of an emergency, contact the Fire Department or the APG Police Department.**

**1-6.10.3.** The building custodian will track and maintain a record of any outstanding work/service orders that were the result of a fire code violation. A log must be kept on the status and the projected completion

date for mediation of the fire code violation.

**1-6.10.4.** Ensure that during inclement weather all outside stairs, ramps and sidewalks are cleared of any accumulation of snow and ice. Every door to a building, structure or facility that serves as an exit shall be kept free of any accumulation of snow or ice to allow clear access to a public way.

**1-6.10.5** Make recommendations to the Fire Chief on ways to improve the fire safety program.

**1-6.11. All Personnel Will:**

**1-6.11.1.** Comply with all fire prevention regulations and directives.

**1-6.11.2.** Report all fires and hydrocarbon spills regardless on how small or even if the fire had been extinguished.

**1-6.11.3.** Maintain a fire safe place to work and live. Ensure that there is a clear passageway from a work space to a means of egress.

**1-6.11.4.** Familiarize themselves with the fire and emergency evacuation procedures within their organization.

**1-6.11.5.** Assist visitors and physically-challenged employees to the nearest exit during an evacuation.

**1-7. COMPLIANCE WITH ORDERS AND NOTICES**

**1-7.1.** Any issuance of a fire code violation in accordance with this regulation shall be complied with by the date provided on the Notice of Fire Hazard. It is the responsibility of the person or persons who sign for the Notice of Fire Hazard to take immediate action to correct the fire hazard.

**1-7.2.** In cases where extreme danger can occur to people or property, immediate compliance shall be required. If immediate compliance cannot be obtained, the operation that caused the danger will be stopped until further notice. If it involves a physical plant (Building, Structure or Facility), it will be closed until mediation is obtained.

**1-7.3.** Where compliance involves construction or major renovation to a building or facility, a job order request will be submitted immediately through the responsible Safety Office and the fire chief's office to obtain interim measures that are acceptable to the Fire Chief to reduce the fire hazard.

**1-7.4.** No person or persons will use any piece of equipment that has been tagged as unsafe until appropriate repairs have been made to the equipment. At no time will the danger tag be removed from the equipment, other than by the person who affixed the tag, or his/her authorized representative.

**1-7.5.** In facilities or rooms that have posted occupancy limits, the person in charge of the facility or room is responsible for ensuring that the posted limits are not exceeded. In the event that a facility is approached by an agency for a function that may exceed the occupancy limit, the agency must provide a floor plan for the proposed use. The floor plan must be submitted to the fire chief's office at least two weeks before the event for approval.

**1-7.6.** It is the responsibility of the facility manager to ensure that the agency has received a special exception occupancy permit from the fire chief's office before the function can be scheduled.

**1-8. PERMITS AND CERTIFICATES**

**1-8.1.** Permits must be obtained from the fire department before the following operations can be accomplished. Items requiring permits or certificates are listed below.

- (a) air supported structures
- (b) assembly occupancies/conference rooms
- (c) bonfire
- (d) bowling alley refinishing / gym floor refinishing
- (e) burning
- (f) cutting with a torch
- (g) fireworks
- (h) flammable finish applications
- (i) gas-fired portable heaters
- (j) LP gas filling operations
- (k) open burning
- (l) open flames in assembly areas
- (m) parking of vehicles in buildings
- (n) sleeping in unauthorized buildings
- (o) tents
- (p) unvented fuel burning equipment
- (q) warming fire
- (r) welding operation
- (s) wood burning
- (t) portable outdoor cooking grills

Permits and certificates shall be required for all operations, conditions or situations listed above.

**1-8.2.** The Fire Chief or his representative will inspect and approve all areas, equipment and devices required for operation under referenced permits or certificates prior to the issuance of such permits or certificates.

**1-8.3.** Permits shall remain on the premises or at the designated site until the expiration of the permit or the completion of the work, whichever comes first, and must be made available for review by fire department personnel.

**1-8.4.** Failure to comply with the conditions stated on any permit or certificate under this regulation or failure to comply with other provisions of this regulation shall be the cause for revocation of the permit or certificate.

**1-8.5.** Failure to obtain a permit or certificate required by this regulation or failure to comply with conditions of the permit or certificate could result in a finding of negligence and places the liability for all portions of losses resulting from such failures to the responsible party.

## **1-9. NOTICES AND NOTIFICATIONS**

**1-9.1.** The fire department will be notified each time a road is closed whether it is for a few hours or a few days.

**1-9.2.** The Directorate of Installation Operations (DIO) will notify the fire department when there is a scheduled power outage. The letter will address the areas that will be affected by the power outages and when they project the power will be restored.

**1-9.3.** The Directorate of Installation Operations/contractor will notify the fire department when they schedule the flushing of fire hydrants. Any person or persons who choose to use a fire hydrant for car washes must receive approval from the fire department prior to its use.

## Chapter 2

### DEFINITION OF TERMS

#### 2-1. GENERAL

**2-1.1** The following terms, for the purpose of this regulation, shall have the meaning given in this chapter if not otherwise modified for a specific section of this regulation.

**2-1.2.** The words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular numbers include the plural and the plural the singular.

**2-1.3.** Where the terms are not defined in this chapter, they shall have their ordinary meanings or such as the context implies.

#### 2-2. DEFINITIONS

**Assessable Area of Refuge.** An area of refuge that complies with the accessible route requirements of NFPA 101 (Life Safety Code) and the American Disability Act of 1990.

**Accessible Means of Egress.** A path of travel, usable by a person with a severe impairment, that leads to a public way or an area of refuge.

**Addition.** An extension or increase in the floor area of a building or structure.

**Aisle Access Way.** The initial portion of an exit access that leads to an aisle.

**Approved.** Acceptable provisions granted by the Authority Having Jurisdiction.

**Assembly Occupancies.** All buildings or portions of buildings used for gathering together fifty (50) or more persons for the purposes of deliberations, worship, entertainment, eating, drinking, and amusement.

**Authority Having Jurisdiction (AHJ).** The organization, office, or individual responsible for approving equipment, installation, alteration, construction or a procedure. In reference to this regulation, the Fire Chief or his representative is the Authority Having Jurisdiction.

**Automatic.** A function without the necessity of human intervention.

**B.E.Q.** Bachelor Enlisted Quarters.

**B.O.Q.** Bachelor Officers Quarters.

**Building.** Any structure used or intended for supporting or sheltering any use of occupancy. The term building shall be construed as if followed by the words "or portion thereof." See also Structure.

**Business Occupancies.** Buildings used for the transaction of business, for keeping accounts and records, and for similar purposes. Computer facilities are considered to be a Business Occupancy.

**Combustible.** Capable of undergoing combustion.

**Combustible Liquid.** Having a flash point at or above 100° (F) or 37.8° (C).

**Common Path of Travel.** That portion of Exit access that must be traversed before two separate and distinct paths of travel to two exits are available. Paths that merge are common paths of travel. Common path of travel is measured in the same manner as travel distance but terminates at that point where two separate and distinct routes become available.

**Concert Seating.** See Festival seating.

**Confined Space.** A space that is large enough and so configured that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit such as; tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry, and are not designed for continuous employee occupancy.

**Critical Radiant Flux.** The level of radiant heat energy on a floor covering system at the most distant flame out point. The unit of measurement of critical radiant flux is watts per square centimeter ( $W/cm^2$ ).

**D.V.Q.** Distinguished Visitors Quarters.

**Educational Occupancies.** Buildings or portion of buildings used for educational purposes through the twelfth grade by six or more persons for four or more hours per day or more than 12 hours per week. Examples are Child Care Centers and Youth Activity Centers.

**Existing.** That which is already in existence on the date when a code or regulation goes into effect, such as existing buildings, structures, or egress facilities.

**Exit.** The portion of a means of egress that is separated from all other spaces of the building or structure by construction or equipment to provide a protected way of travel to the exit discharge. Exits within a building or structure are hallways, corridors, horizontal exits, and stairs.

**Exit Access.** The portion within an office, classroom, shop or laboratory that leads to an entrance to an exit.

**Exit Discharge.** The portion of a means of egress between the building and the safe area outside the building to a public way.

**Festival Seating.** That form of audience/spectator accommodation in which no seating, other than a floor or ground surface, is provided for the audience/spectators gathered to observe some performance.

**Fire Barrier.** A continuous membrane, either vertical or horizontal, such as a wall or floor assembly that is designed and constructed with a specified fire resistance rating to limit the spread of fire and that also will restrict the movement of smoke.

**Fire Compartment.** A space within a building that is enclosed by fire barriers on all sides, including top and bottom.

**Fire Resistance Rating.** The time, in minutes or hours, that materials or assemblies have withstood a fire exposure.

**Flame Spread.** The propagation of flame over a particular surface.

**Flammable Liquid.** Having a flash point below 100°F or 37.8°C.

**Flash Point.** The minimum temperature at which a liquid gives off vapors in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

**Fumes.** Airborne dispersion consisting of minute solid particles arising from heating of a solid material (lead), in distinction to a gas or vapor. Physical change is often accompanied by a chemical reaction, such as oxidation. Odorous gases and vapors should not be referred to as vapors.

**Hazardous Area.** Those areas of structures or buildings posing a degree of hazard greater than that normal to the general occupancy of a building or structure, such as those areas used for the storage or use of combustibles or flammables; toxic, noxious, or corrosive materials; or heat-producing appliances and devices.

**Hazardous Material or Hazardous Chemical.** Material presenting dangers beyond the fire problems related to flash point and boiling point. These dangers may arise from but are not limited to toxicity, reactivity, instability or corrosivity.

**Hazardous Wastes.** Discarded materials regulated by the Environmental Protection Agency because of public health and safety concerns. Regulatory authority is granted under the Resource Conservation and Recovery Act (RCRA), and the U.S. Environmental Protection Agency, 40 CFR 260-281.

**Hypergolic.** Two chemical substances that spontaneously ignite upon mixing.

**Industrial Occupancies.** Any building, facility or structure that is used for making products of all kinds and properties devoted to operations such as processing, assembling, mixing, packaging, finishing or decorating, and repairing.

**Incident Commander (IC).** The senior fire officer who is responsible for the management of all incidents, such as, fires, traffic accidents with injuries, hazardous material incidents, rescues, and other chemical or nuclear incidents.

**Labeled.** Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

**Listed.** Equipment or materials included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials and by whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

**Material Safety Data Sheet (MSDS)** A document which contains information regarding the chemical composition, physical and chemical properties, health and safety hazards, emergency response, and waste disposal of the material as required by 29 CFR 1910.1200.

**Means of Egress.** A continuous and unobstructed way of exit travel from any point of the building, structure, facilities, and mobile facilities to the outside or a protected area of refuge. A means of egress has (3) three distinct parts: (a) exit access, (b) exit, and (c) exit discharge. A means of egress includes the vertical and horizontal travel and must include intervening spaces, doorways, hallways, corridors, passageways, ramps, stairs, stair enclosures, lobbies, horizontal exits, courts and yards.

**Means of Escape.** A way out of a building or structure that does not conform to the strict definition of means of egress but does provide an alternate way out.

**Mercantile Occupancy.** Stores, markets, and other rooms, buildings, or structures for the display and sales of merchandise.

**Mitigation.** Any offensive or defensive action to contain, control, reduce, or eliminate the harmful effects of a hazardous material release.

**Mixed Occupancies.** Where two or more classes of occupancy occur in the same building or structure and are intermingled so that separate safeguards are impracticable. Most restrictive life safety requirement will apply to the building or structure.

**Noncombustible.** A material that, in the form in which it is used and under the conditions anticipated, will not aid combustion or add appreciable heat to an ambient fire.

**Occupancy.** The purpose for which a building or portion thereof is used or intended to be used.

**Occupant Load.** The total number of persons that might occupy a building or portion thereof at any one time.

**Place of Assembly.** See assembly occupancy.

**Plenum.** An air compartment or chamber to which one or more ducts are connected and that forms part of an air distribution system.

**Post Indicator Valve.** Generally referred to as a (PI) valve. A long cylindrical pipe approximately 6 inches in diameter, red in color, within 50 feet of a building. The PI valve controls the water supply to the sprinkler system.

**Public Way.** Any street, alley, or other similar parcel of land open to the outside air, appropriated for public use such as sidewalks, parking lots, etc.

**Residential Occupancies.** Those occupancies in which sleeping accommodations are provided for normal residential purposes and include all buildings designed to provide sleeping accommodations. For the purpose of this regulation, those residential occupancies are: housing units, barracks, dormitories, BOQ, BEQ, DVQ, guest house and VOQ.

**Self-Closing.** Equipped with an approved device that will ensure closing after having been opened.

**Smoke Barrier.** A continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly, that is designed and constructed to restrict the movement of smoke. A fire barrier might or might not have a fire resistance rating.

**Smoke Compartment.** A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

**Storage Occupancy.** All buildings or structures utilized primarily for the storage of sheltering goods, merchandise, products, vehicles, or animals.

**Vertical Opening.** An opening through a floor or roof.



### Chapter 3

#### Fundamental Requirements to Fire Safety

#### 3-1. REPORTING FIRES AND OTHER EMERGENCIES, FALSE ALARMS

**3-1.1.** All fires, regardless how minor in nature, and fires which have been extinguished, shall be reported to the fire department immediately.

- a. However, fires resulting from experiments and the testing of national defense material which are explosive-loaded components, resulting in a brush fire, woods or field fire, will be reported before the fire can develop into any significant size.
- b. Fire resulting from experiments and testing of defense material that results in personal injuries or property damages shall be reported immediately.

**3-1.2.** The person discovering any fire, regardless of magnitude, shall:

- a. Make every attempt to warn all occupants of the fire by shouting "FIRE".
- b. Respond to the nearest fire alarm pull station and activate the interior fire alarm if one is available.
- c. Dial '911' to notify the fire department.
- d. Use fire alarm city street boxes, mounted on poles in residential areas.

Personnel who activate a city street box must stand by the box to await arriving emergency forces. **Explanation:** City street boxes send an electronic frequency code to the appropriate fire station. The computer will only display the physical location of the city street box.

e. Use cellular telephones in remote areas by dialing: (410) 278-7220 in the Aberdeen area, and (410) 676-0960 in the Edgewood area.

f. Use the radio trunking system through APG communication channels.

g. Notify the emergency operator and relay their location as Aberdeen Area (AA) of APG or Edgewood Area (EA) of APG. This includes commercial telephones on AA or EA Installations in residential occupancies, businesses, at pay telephones, by contractors or any other person who is leasing a telephone number through Bell Atlantic, AT&T, etc.

**Explanation:** The '911' emergency call will go through Harford County Emergency Operations. The caller should identify that they are calling from AA area of APG or EA area of APG. The Harford County '911' dispatcher will automatically transfer the call to the appropriate APG '911' dispatcher for immediate action.

**3-1.3.** Information to be Reported

- a. Describe what is on fire (field, car, building, kitchen, house, etc.)

- b. Building number, apartment number, or other location nearest to the fire.
- c. Name of person reporting and the telephone number from which they are calling.
- d. If the person is not personally in danger, stay on the line until excused by the emergency operator.
- e. Report other pertinent information, such as: physically challenged individual that needs assistance, suspicious events, and exact location in the building.

### 3-1.4. Other Emergencies

### 3-1.5. Other emergencies shall be reported by dialing 911, such as:

- a. Traffic accidents
- b. Oil spills, gasoline spills
- c. Release of hazardous materials
- d. Natural gas leaks
- e. Discovery of unexploded ordnances
- f. Cave ins, rescues
- g. Bomb threats
- h. Infants locked in a vehicle or home

**NOTE:** keys locked in a vehicle or an animal rescue does not constitute an emergency.

**3-1.6. Marking of Telephones.** The person in charge of each building or section of a building will insure that **EAP Label 1001 (Emergency 911 Sticker)** is affixed to all telephones.

## 3-2. FALSE ALARMS OR MALICIOUS INTENT

**3-2.1.** No person shall make, issue, post, or maintain any regulation or order, written or verbal, that would require any person to take any unnecessary delaying action prior to reporting a fire to the fire department.

**3-2.2.** No person shall deliberately or maliciously turn in an alarm of fire when, in fact, that person knows that no fire exists.

**3-2.3.** No person shall report, signal or transmit a false alarm to an emergency force or building occupants.

**3-2.4.** A false alarm or malicious intent is the reporting, signaling or stating that there is a fire or other emergency at any point when there is no emergency or indication of an emergency at that location. Included are reports by telephone, in person, sounding a fire alarm or any other method that would cause occupants or emergency forces to react or respond as if a fire or other emergency actually exist.

**3-2.5** Any person or persons who intentionally conduct a malicious intent by reporting a false alarm will be arrested and prosecuted under state and federal laws.

**3-3. INSTALLATION AND MAINTENANCE OF PORTABLE AND FIXED FIRE PROTECTION SYSTEMS AND APPLIANCES:** The installation and maintenance of all fire protection systems shall be in accordance with this regulation and references of codes and standards contained herein.

**3-3.1. The types of systems, equipment and appliances required as follows:**

- (a) Portable fire extinguishers.
- (b) Alarm and detection systems, both manual and automatic.
- (c) Sprinkler systems, wet and dry.
- (d) Fixed fire extinguishing and suppression systems.
- (e) Emergency lighting systems as well as individual units.
- (f) Illuminated exit signs.
- (g) Stand pipe systems.
- (h) Explosion suppression systems.

**3-3.2. ACCEPTANCE AND TESTING**

**3-3.2.1.** Design plans, specifications, shop drawings/calculations, and submittal for any of the recognized systems shall be submitted to the fire chief's office for approval before work can be accomplished.

**3-3.2.2.** An acceptance test shall be conducted on all fire protection system before final approval can be made. The fire department will conduct test on specific systems in accordance with the specifications, standards, applicable codes, and regulations referenced herein and approved by the Fire Chief. At no time will a system be considered complete and usable prior to the approval from the fire chief's Office.

**3-3.3. FIRE EXTINGUISHERS**

**3-3.3.1.** The Fire Chief is the final authority on determining the type, size, and placement of portable fire extinguishers in a building or facility. The determination will be based on the occupancy use of a particular building or facility. If at any time the occupancy of a building changes, the fire department must be notified immediately to insure adequate fire protection for the occupancy use.

**3-3.3.2.** The maintenance, installation, and relocation of any portable fire extinguisher is the sole responsibility of the fire department.

**3-3.3.3.** The occupants will not remove any fire extinguishers from any building or facility for maintenance or repair. The occupants must call the fire department and place a service order for repair and/or maintenance as soon as the problem is found.

**3-3.3.4.** Fire extinguishers that are mounted in or on equipment or vehicles will be removed by the user and delivered to the nearest fire station for maintenance or repair.

**3-3.3.4.1.** Motor vehicles used for transporting explosives shall be equipped with at least (2) two fire extinguishers, with a classification of ABC rating. The size of the extinguishers shall be determined by this regulation and applicable references contained herein.

**3-3.3.5.** Fire extinguishers will not be removed from their assigned locations by the building occupants to prop doors, or for any other reason except for fire fighting.

**3-3.3.6.** Extinguishers shall be located where they will be accessible for immediate use. Motor vehicle operators shall make an inspection of extinguishers to insure that they are charged (filled) and appear to be in good working order before transportation of explosive materials.

**3-3.3.7.** When a fire extinguisher has been discharged for any reason, it must be reported immediately to the fire department. All fires must be reported immediately to the fire department regardless how small the fire is.

**3-3.3.8.** Organizations moving from one building or facility to another will contact the fire department to have appropriate fire extinguishers installed at their new location. Fire extinguishers will not be moved from building to building by the occupants, unless the extinguishers are mounted on mobile equipment or vehicles.

**3-3.3.9. RECORD KEEPING.** All portable fire extinguishers shall have an inspection tag placed in clear view.

**3.3.3.10.** Inspection of fire extinguishers shall be made (monthly) by the building occupants and equipment users. The inspector will enter the date of the inspection, condition of the extinguisher, and the inspector's initials in the appropriate columns on the extinguisher inspection tag. Once the inspection tag has only 6 entry lines remaining, the inspector must contact the fire department to make arrangements for replacing the inspection tag. The inspector will also contact the fire department of any deficiencies found during the inspection. The building fire marshal shall maintain a record of all extinguishers by types and location assigned to a building or facility.

**3-3.3.11.** Personnel making inspection shall include a check of the following items:

- (a) Operating instructions on the nameplate are legible and facing outward.
- (b) Extinguishers are readily accessible and visible, and a clearance of (2) two feet shall be maintained on either side of the extinguisher.
- (c) Extinguisher bracket or hanger is properly secured, and the extinguisher can be easily removed from the bracket.

- (d) Examination for obvious physical damage, clogged or missing nozzle, corrosion, leakage, cylinder dented or bulging out, and hose frayed or split.
- (e) Pressure gauge reading or indicator is in the operable range or position.
- (f) Extinguisher pin and seal are intact, and there is no evidence of tampering.
- (g) The fire extinguisher inspection tag is intact.

### **3-3.4. FIRE ALARM AND DETECTION SYSTEMS**

**3-3.4.1.** The Fire Chief has the final authority in determining the type of alarm system to be installed. Complete information regarding the system, including specifications, wiring diagrams, and floor plans shall be submitted for approval to the fire chief's office.

(a) All manual or automatic fire alarm systems shall be designed that their sound level be at least 15 decibel (DBA) above the average ambient sound level, so the alarm signal can be clearly heard regardless of the maximum noise level obtained from machinery or other equipment under normal conditions of occupancy

(b) The fire alarm signals shall be distinctive in sound from any other signal to minimize the confusion to the occupants.

**3-3.4.2.** At no time will any modification or alteration be made in any building or facility equipped with a fire alarm system until approval has been obtained from the fire department. Any modification or alteration to a fire alarm system that would reduce its use or effectiveness is prohibited.

**3-3.4.3.** Personnel who are responsible for the repair or alteration of a building or facility that could create dust or smoke must call the fire department before work can be accomplish. Upon completion for the day, personnel must call the fire department to place the fire alarm system back in-service. This will reduce the risk of false alarms.

**3-3.4.4.** Fire alarm systems will not be used for any purpose other than actual fires or fire drills. No person will activate a fire alarm in order to conduct a fire drill until approval has been obtained from the fire department.

**3-3.4.5.** Fire alarm equipment shall not be blocked or obstructed by furniture, office partitions, and equipment. When office partitions are used to create a hallway to an exit, arrangements shall be made to insure that fire alarm pull stations are clearly visible in the path of travel to the exit.

**3-3.4.6.** Tampering, altering, or removing any fire alarm equipment from service without obtaining permission from the fire department is prohibited.

### **3-3.5. Sprinkler Systems**

**3-3.5.1.** The Fire Chief has the final authority in determining what type of sprinkler system shall be installed in a building or facility. All shop drawings, calculations, and design plans shall be submitted for approval prior to the installation.

**3-3.5.2.** No alterations or modifications will be made to any building, facility, or structure that is equipped with a sprinkler system without prior approval of the fire department. Such approval will only be granted when plans for alterations or modification include plans to maintain full and complete sprinkler coverage.

**3-3.5.3.** Occupants are responsible to ensure that the main sprinkler riser, inspector's test valve, fire department connections, and other appliances connected to the sprinkler system are free from obstructions. A clearance of no less than 24 inches shall be maintained around sprinkler appliances.

**3-3.5.4.** Sprinkler appliances that are connected to the outside of any building or structure shall be clearly visible. Vegetation that blocks the view or obstructs the use of a fire department connection must be removed.

**3-3.5.5.** Building custodians or occupants have the responsibility to ensure that sprinkler heads are not painted. Buildings that are equipped with a paint booth shall place a plastic baggy over the sprinkler heads, to ensure paint residue does not interfere with the operation of the sprinkler head. A plastic baggy must be replaced when there is an excessive accumulation of paint residue.

**3-3.5.6.** Storage of any other items shall be maintained to provide a minimum vertical clearance of 18 inches below sprinkler head. If storage is 15 feet high or more, a minimum vertical clearance of 36 inches will be maintained below the sprinkler head.

**3-3.5.7.** Testing and maintenance of a sprinkler system is solely the responsibility of the fire department. All installation and modification of a sprinkler system shall be in accordance with codes and regulations referenced herein.

**3-3.5.8.** Any failure in the sprinkler system (leaky pipes, water running outside of the building, etc.) shall be reported to the fire department immediately.

### **3-3.6. Fixed Fire Suppression Systems**

**3-3.6.1.** Fixed fire suppression systems are defined as follows: (a) halon total flooding system, (b) range guard system, (c) dry chemical system, and (d) Co2 systems.

**3-3.6.2.** The Fire Chief has the final authority in determining what type of fire suppression system is required for a specific operation. All engineering designs, plans, scopes of work shall be submitted to the fire chief's office for approval.

**3-3.6.3.** No person will tamper with, remove from service, alter or modify any fixed fire suppression system without the prior approval of the fire department.

**3-3.6.4.** All commercial kitchens shall be protected by a fixed fire suppression system. Commercial cooking hood system shall have all filters in place while cooking. Every effort shall be made as not to tamper or interfere with the fixed suppression system while cleaning the hood.

**3-3.6.5.** Cooking equipment such as deep fat fryers, ranges, grills, griddles, and broilers shall be placed under a hood system in commercial buildings or facilities.

**3-3.6.6.** A manual activation station for the fixed fire suppression system shall be provided in a path of exit or egress and shall be clearly identified.

**3-3.6.7.** Obstructing or blocking any component that is part of the fire suppression system is prohibited. Articles placed around the cylinders and controls could cause the system to accidentally discharge.

**3-3.6.8.** Computer rooms that are protected by a fixed fire suppression system will not be enlarged, reduced in size or otherwise modified without the approval of the fire department.

**3-3.6.9.** Halon storage containers and accessories shall be located and arranged that inspection, testing, recharging and other maintenance programs can be accomplished without obstruction.

### **3-3.7. Emergency Lighting and Exit Signs/lights**

**3-3.7.1.** Any alteration or modification to a building or facility that will reduce the effectiveness of emergency lighting or exit signs is prohibited. All plans for modification or alteration to any building or facility must be approved by the Fire Chief.

**3-3.7.2.** All buildings or facilities, or portion thereof, that are windowless, or any building that serves more than 100 people per floor shall be equipped with emergency lighting.

**3-3.7.3.** Internally illuminated exit signs must be lighted at all times when the building is occupied.

**3-3.7.4.** Any failure of exit sign lighting or emergency lighting will be reported to the DIO work order section, and the fire department immediately.

**3-3.7.5.** The use of radio-active material for a lighting source in exit signs is prohibited.

**3-3.7.6.** The installation of emergency lighting and illuminated exit signs shall be in accordance with national fire codes and regulations referenced herein.

### **3-3.8. Stand Pipe Systems**

**3-3.8.1.** No person will tamper, impair, obstruct, remove from service or otherwise alter any stand pipe system or equipment. Any alteration or modification to a stand pipe system must be approved by the fire department.

**3-3.8.2.** The fire department connection for stand pipe systems shall have a sign designating "**STAND PIPE.**" For multiple stand pipe systems, the building number shall be inscribed on the sign "**STAND PIPE, BUILDING #.**" The fire department connection shall be maintained to provide maximum access and visibility.

**3-3.8.3.** Any failure, leakage or other defects in any stand pipe system shall be reported to the fire department immediately.

**3-3.8.4.** Stand pipe and hoses attached to the stand pipes shall not be used for any purpose other than fire fighting.

### **3-3.9. Explosive Suppression Systems**

**3-3.9.1.** No person will tamper, alter, modify or remove from service any explosion suppression system without prior approval from the fire department.

**3-3.9.2.** It is the responsibility of the occupant to ensure that cables and pulleys or any other device that activates the suppression system is not painted. Painted cables or pulleys could cause a delay in the operation of the suppression system.

**3-3.9.3.** No person will load, mix, or heat any explosive material in an area where the explosive suppression system is out of service. Any exceptions must be approved by the Fire Chief and the safety office before work can be resumed.

**3-3.9.4.** Areas around the sprinkler valves and inspector's test valves shall be kept clear by at least 36 inches.

**3-3.9.5.** No person will tamper, move, or block UV (ultra-violet) detectors. The UV detector is an appliance connected to the explosive suppression system. UV detectors shall be positioned to point to a specific work area.

**3-3.9.6.** Any alteration or modification to a high-speed suppression system must be approved by the fire chief's office.

**3-3.9.7.** The fire department has the responsibility of testing of all the equipment and system listed in this chapter. Routine maintenance, acceptance testing and minor repair to equipment and systems shall be by or under the guidance of the fire department.

## **3-4. BUILDING FIRE EVACUATION PLAN AND FIRE FIGHTING SOP**

**3-4.1.** Every occupied building shall have a Standard Operating Procedure (SOP) for building fire evacuation and fire fighting instructions. The SOP will be conspicuously posted for review. As part of the SOP, a fire evacuation plan must be posted in areas where the exits are not obvious. The following information must be provided on the fire evacuation floor plan.

- a. The location of the primary exit from a particular area of the building. An alternate route to another exit in the event the primary exit is obstructed by fire or smoke.
- b. Areas of refuge for the physically challenged.
- c. The locations of fire extinguishers or other auxiliary fire fighting equipment.



d. Locations of fire alarm pull stations or locations of manual activation of fixed extinguishing systems.

e. Locations for shutting down or discontinuing special operations, machines, experiments, etc.

**3-4.2.** A fire evacuation plan SOP must contain the following information:

a. A detail set of instructions of procedure for reporting a fire or other emergencies. Outline an alternate means of reporting fires and other emergencies.

b. A life safety strategy and procedures for notifying, relocating, or evacuating occupants. Identification and assignment of personnel who are responsible for accounting for employees and occupants after evacuation has been completed.

c. Procedures for employees who must remain to operate critical equipment before evacuating.

d. Where applicable, special instructions concerning safeguarding of classified material. It should be made clear, in all cases, that the safety of personnel will not be jeopardized in order to save property.

### **3-5. MEANS OF EGRESS**

**3-5.1.** A means of egress (exit way) is a continuous and unobstructed way of exit travel from any point of the building, structure, facilities, and mobile facilities to the outside or a protected area of refuge. A means of egress has (3) three distinct parts: (a) exit access, (b) exit, and (c) exit discharge. A means of egress includes the vertical and horizontal travel and must include intervening spaces, doorways, hallways corridors, passageways, ramps, stairs, stair enclosures, lobbies, horizontal exits, and court yards in accordance with this regulation and references contained herein.

#### **3-5.2.** Definitions

**(a) EXIT ACCESS** is that portion within an office, classroom, shop, or laboratory that leads to an entrance to an exit.

**(b) EXIT** is that portion of a means of egress that is separated from all other spaces of the building or structure by construction or equipment to provide a protected way of travel to the exit discharge. Exits within a building or structure are hallways, corridors, horizontal exits, and stairs.

**(c) EXIT DISCHARGE** is that portion of a means of egress between the building and the safe area outside the building to a public way.

**3-5.3. WORKMANSHIP OF EXITS.** It is the responsibility of the occupant to insure that doors, stairs, and ramps are properly maintained in a workmanlike manner.

**(a) EXIT OBSTRUCTION.** Office furniture and equipment, including storage, shall not be placed in the required width of any hallway, aisle, or corridor that would reduce the means of egress, unless it is approved by the Fire Chief. In the event that furniture or equipment must be moved into the hallways or corridors in order make alterations to a specific work area, arrangements must be made to accomplish this during non-duty hours or at a time where the occupancy is low.

**(b) STAIRS.** Storage shall not be placed on stair landings or any part of the stair enclosure.

**Exception:** The area under the stairs may be used for storage, providing it is completely enclosed with sheet rock and provides a 1 hour fire resistive rating. The enclosure must be approved by the Fire Chief.

**3-5.4. DOORS.** All doors must be maintained in a workmanlike manner. The force required to fully open any door manually in a means of egress shall not exceed (15) pounds of force to release the latch and place the door in motion.

**(a)** All exit doors shall be clearly marked (EXIT). The signs shall be placed above the door, and will be readily visible to provide contrast with distinctive color and not blend in with the interior finish.

**(b)** All doors must be unlocked whenever the building is occupied and regardless of the occupancy. The use of hasp, padlock, bar, chain or any other device placed on exit doors is prohibited.

**(c)** All doors shall be equipped with a knob, handle, panic bar, or any other simple type of releasing device having an obvious method of operation. Doors shall be designed as to provide a handle or knob on either side of the door, in order to allow emergency forces in and out of a particular area. The door-locking assembly shall be arranged where no special knowledge or equipment must be used such as a key to open the door each time entrance or discharge from the area.

**(d)** Exits that are equipped with double doors shall have the concealed bolt or latches release to make both doors accessible for use whenever the building is occupied.

**(e)** Blocking, wedging, or propping open of any door, or otherwise impairing of any door that is equipped with a self-closing or automatic-closing device is prohibited.

**Exception:** If the doors are installed in a heavy traffic area, the occupants could place a work order in to install magnetic door stops. The magnetic door stops must be tied into the existing fire alarm system. Once the alarm system activates, the magnetic door stops will automatically release and close the doors.

**(f)** Any alterations or modification to any exit must be approved by the fire chief's office. Future alterations to an exit must be designed as to allow the door to swing in the direction of exit travel. Doors that are replaced through fair wear and tear shall be replaced with the same construction type of the existing door.

(g) Blocking any door to a corridor or hallway must be approved by the fire chief's office, especially in high hazard, industrial occupancies. Once approval is obtained, a sign must be placed on the door indicating "**BLOCKED DOOR**" in (2) two inch letters. A sign must be placed on the center of the door as well as (10) ten inches from the floor for fire fighting personnel.

### 3-6. SMOKING

**3-6.1.** All civilian, military, and contractors employed or providing a service on this installation shall comply with the installation smoking policy.

**3-6.2.** The smoking or carrying of a lighted pipe, cigar, cigarette or any other type of smoking paraphernalia or material is prohibited around flammable and explosive environments.

**3-6.3.** Where required by national fire codes, or code of federal regulations or any other regulation or standard, "**No Smoking**" signs shall be displayed in a conspicuous location in each structure or location in which smoking is prohibited.

**3-6.4.** Designated smoking areas shall be kept clear of combustible material. A high standard of cleanliness shall be maintained at all times.

**3-6.5.** It is the occupants' responsibility to ensure the proper discarding of smoking material. Ensure that suitable noncombustible ash trays or receptacles are placed in designated smoking areas. The discarding of smoking material outside in mulch area or other combustible material is prohibited.

### 3-7. HOUSEKEEPING

**3-7.1.** A high standard of cleanliness and good housekeeping will be maintained in and around buildings at all times.

**3-7.2.** Excessive accumulation of combustible trash and waste material will be disposed of in a proper manner. Large amounts of combustible trash (wooden pallets, combustible crates, and large boxes) will not be stored within 20 feet of any building or structure.

**3-7.3.** Combustible bulk waste paper to be recycled shall be kept in a noncombustible container. The large container must be equipped with a lid, and the lid must be kept in place at all times. Containers used for recycling will not be stored in any main hallway or on the landings or stairways.

**3-7.3.1.** Occupants may use the open face blue recyclable bins in offices. Once the recyclable bins are filled, it is the occupants' responsibility to empty the bins into the recyclable totes or to remove to a recyclable dumpster.

**3-7.3.2.** It is the occupants' responsibility to contact the quality assurance office (QAO) at extension (410) 278-4747/9741 when the recycle containers are full. Special arrangements must be made through the quality assurance branch for a special pick-up during moves or when there will be an excessive amount of recyclable to be generated.

Every effort will be made to contact QAO one week in advance, where practical, for additional refuse removal.

**3-7.3.3.** Dumpsters shall not be placed closer than 10 feet from any building or structure unless approved by the fire department in writing. Parking vehicles within 10 feet from any combustible waste refuse area or container is prohibited. Placing combustible waste refuse on top and around the dumpster area is prohibited.

**3-7.3.4.** Accumulation of wastepaper, hay, straw, grass, weeds, litter, combustible or flammable waste material, waste petroleum products or rubbish of any kind shall not be permitted to remain in, on, under or adjacent to any building, facility, storage area or space including mobile homes, office or work trailers, and vehicles.

**3-7.3.5.** All oily rags, paint contaminated cloths, and similar waste material shall be placed in a covered noncombustible container if kept in a building.

**3-7.3.6.** Floors will be kept clean at all times. Accumulation of grease and oil on any floor surface is prohibited.

**3-7.3.7.** Only floor cleaning, sweeping, polishing, and absorbing compounds that are listed for such use will be used. The use of sawdust for absorbing oil, grease, etc., is prohibited.

**3-7.3.8.** Steel wool can be used for stripping floors or for applying paste wax. However, once it becomes contaminated with those products, the steel wool must be placed in a covered noncombustible container, or disposed of outside of the building.

### **3-8. FIRE BREAKS**

**3-8.1.** Vegetation will be controlled by mowing, cutting, sterilization of soil or other methods within a 15-foot wide area surrounding buildings or other important structures to eliminate the fire potential in the event of a grass or brushfire. Lumber or other combustible material stored in the open will be protected in accordance with paragraph 6-8.11 of this regulation.

**3-8.2.** Self-contained van-type trailers containing equipment of high value will be placed a minimum of 20 feet between similar type trailers or other buildings. Gasoline or other highly combustible material will not be stored under or near such trailers. Dry grass, dead vegetation, etc., will be controlled as to not constitute a fire hazard under the trailer or communicate fire from one trailer to another.

**3-8.3.** Incidental buildings, vehicles, communication cables, cameras, generators, targets, power supply lines and any other test equipment within range areas will be properly protected by fire breaks. It is the responsibility of the activity's personnel to establish and maintain fire breaks in and around the equipment and instrumentation of which they have placed.

### **3-9. FIRE LANES**

**3-9.1.** Fire lanes shall be provided for all buildings that are set back more than 150 feet from a public road.

**3-9.2.** Fire lanes shall not be less than 20 feet of unobstructed width, able to withstand live loads of fire apparatus and have a minimum of 14 feet of vertical clearance. An approved turnaround for fire apparatus shall be provided where an access road is a dead end and is in excess of 150 feet in length. The turnaround shall have a minimum centerline radius of 50 feet. The grade of the fire lanes shall be within the limits established by the fire chief's office

**3-9.3.** When bridges are replaced or modified, the fire department must be contacted.

**3-9.4** Fire lanes shall be marked with freestanding signs or marked curbs, sidewalks, or other traffic surfaces that have the words "**FIRE LANE-NO PARKING**" painted in contrasting colors. The size of letter that are placed on the road surface shall be at least 12 inches in height and the stroke of the letter shall be at least 1 inch.

**3-9.5.** Fire lanes shall be maintained free of all obstacles at all times. Vehicles illegally parked in fire lanes are subject to ticketing and/or being towed away, at the owner's expense in accordance with law enforcement regulations.

**3-9.6.** The Fire Chief shall have the authority to designate fire lanes and have signs posted indicating that parking is prohibited.

### **3-10. FIRE HYDRANTS AND OTHER PUBLIC WATER SYSTEMS**

**3-10.1.** No person shall remove from service, tamper with or otherwise disturb any fire hydrant or water main without the permission of the fire department and the water department. The DIO/contractor shall have the authority to remove portions of the water system from service for routine and emergency repairs and maintenance. The fire department will be notified of specific areas and appliances to be removed from service as far in advance as possible.

**3-10.2** Any person requiring the use of a fire hydrant for supplying water for any purpose shall first obtain permission from the fire department and the water department. The use of any item other than a hydrant wrench to open or close a fire hydrant is prohibited. If damage is caused by the use of any item other than a hydrant wrench to open or close a fire hydrant, the person using the alternate tool will be responsible for any damage and will be held liable for the entire cost of repair.

**3-10.3.** Fire hydrants shall be located so that all parts of any building can be reached by a hose line of not more than 500 feet in length.

**3-10.4.** Fire hydrants shall be located at every intersection; and if the intersections are more than 400 feet apart, intervening hydrants shall be provided to maintain not more than 400 feet between fire hydrants. Building or street arrangements resulting in unusual configurations may require additional hydrants as determined by the Fire Chief.

**3-10-5.** When buildings are located on cul-de-sacs, one fire hydrant shall be located at the entrance to the cul-de-sac. If the cul-de-sac exceeds 400 feet, additional fire hydrants shall be provided to maintain a maximum spacing of 400 feet.

**3-10.6.** A fire hydrant shall be located within 300 feet of every fire department connection for sprinkler or standpipe systems.

**3-10.7.** A 3-foot clearance of clear space shall be maintained around the circumference of fire hydrants. Fire hydrants shall be kept free of snow, ice, or other materials and protected against mechanical damage so that free access is ensured.

**3-10.8.** Painting and marking of fire hydrants shall be accomplished as specified in the latest edition of NFPA 291. Fire hydrants are painted a standard color (fluorescent yellow) and the bonnets are to be color coded based on a water flow test. When fire hydrants need repainting, the fire department shall be notified to determine the proper color. Repainting of hydrants shall be accomplished by the use of reflective-type paint.

**3-10.9.** All fire hydrants that have been placed out of service shall be identified with a bonnet marked "**OUT OF SERVICE.**"

### **3-11. INCIDENTAL STORAGE**

**3-11.1.** Storage of combustible materials e.g. (computer paper, copying paper, files) is prohibited in spaces or closets located under stairways constructed wholly or partly of combustible material. Any storage underneath open stairways is strictly prohibited. Material will not be placed or stored on stairways. Acceptable storage areas such as cabinets, closets, spaces under benches, platforms, etc. will be kept clean. The storage material will be arranged in an orderly manner, and inspections will be conducted periodically to ensure that fire hazards are not accumulating.

**3-11.2.** Storage in basements and attic spaces is prohibited unless approved in writing by a representative of the Fire Chief. Where storage is approved, material will be limited to a reasonable amount and arranged in an orderly manner with proper clearance from all equipment. Where storage of boxed files are placed in the basement, boxed files must be kept at least 24 inches from interior walls to allow for expansion if water damage occurs. Cross aisles shall be provided every 25 feet of boxed storage. The width of cross aisles shall be 36 inches. Boxed storage may only be stacked three high.

**3-11.3.** Storage of combustible material may be stored in hallways provided the material is stored in approved noncombustible storage cabinets, and the cabinets do not interfere with the required clear width of the hallways based on the occupancy use. The required hallway width shall be determined by the fire chief's office.

**3-11.4.** Combustible and noncombustible material stored in mechanical or boiler rooms is strictly prohibited. However, materials that are required for the daily operation of the boiler room is permitted.

### **3-12. BUILDINGS HOUSING KITCHENS OR COOKING EQUIPMENT**

**3-12.1.** This section is concerned with the potential fire hazards of cooking, regardless of the type of cooking equipment use (e.g. public or private facilities). This includes the use of residential cooking stove used in occupancies other than residential single family homes such as employee kitchens or break areas, church and meeting hall kitchens. Regardless of the frequency of use, it shall be protected in accordance with paragraphs 3-3.6.4 through 3-3.6.7, and the latest edition of NFPA 96.

**3-12.2.** Building occupants are responsible for the frequent cleaning of the exterior and interior of kitchen stoves and other cooking surfaces. The area surrounding the cooking surface shall be cleaned frequently to remove accumulated grease on walls and exhaust hoods. The floor surface around the cooking appliance shall be kept free of grease at all times.

**3-12.3.** Filters in exhaust hoods will be removed and cleaned frequently to eliminate the accumulation of grease. In commercial kitchens, filters will be cleaned at least twice weekly or more frequently where grease accumulation is extremely heavy. Cooking will not be permitted when filters are not in place or are positioned in such a way as to create an opening that would permit grease or vapors to enter the hood assembly without passing through the filters.

**3-12.4.** In commercial cooking areas (e.g. mess halls, restaurants, and snack bars), arrangements shall be made for the periodic cleaning of fans, motors, and mechanical parts located near and inside of the duct work on a cyclic basis. Caution must be taken in the cleaning operation as not to pre-activate the fire extinguishing system.

**3-12.5.** Cooking in commercial kitchens where the fire extinguishing system has been discharged or has been placed out of service is prohibited.

**3-12.6.** The use of electric skillets, deep fat fryers, toasters, hot plates and other cooking appliances is prohibited in individual dormitory rooms. Microwaves are permitted in individual dormitory rooms for permanent party personnel only.

**3-12.7.** If grease in pans, skillets or other containers catch on fire, no attempt should be made to move the container until the fire has been extinguished. A noncombustible lid should be placed near the appliance to cover the burning container. Every effort will be made to remove the source of heat from under the container by turning off the electricity or gas.

**3-12.8.** A portable fire extinguisher shall be placed near cooking operations.

**3-12.9.** Building occupants must contact the fire chief's office to obtain approval prior to installing or placing a cooking stove in service.

### **3-13. MODERNIZATION, ALTERATION OR RENOVATION OF BUILDINGS**

**3-13.1.** All modifications, alterations and renovations to buildings, structures, or facilities shall be reviewed by the fire chief's office prior to accomplishment to assure compliance with the latest edition of regulations, national fire codes and standards.

**3-13.2.** All self-help modification to any building, structure or facility shall be approved by the fire chief's office prior to accomplishment. All self-help projects submitted to the fire chief's office for approval shall consist of plans, shop drawings and a list of materials.

**3-13.3.** Persons or organizations vacating a building, structure, facility or area shall remove any and all noxious and hazardous material, waste, rubbish, equipment, supplies or other matter. Heat shall be maintained in all vacant buildings protected by a wet pipe sprinkler system until such time as the sprinkler system can be totally drained to prevent freezing.

**3-13.4.** A building, structure, facility or area shall be permitted to be occupied during construction, repair, alteration or additions only if all required means of egress and all fire protection features are in place and are continuously maintained.

**3-13.5.** No addition or modification shall be permitted to any building, structure or facility which would lower the standard classification of construction. Example: No additions containing wood construction shall be permitted to be attached to a noncombustible building. Modifications will not be approved in buildings with existing deficiencies or unsafe conditions unless the deficiencies are included for correction as part of the modification.

**3-13.6.** Any occupied building, structure or facility shall not have holes in the walls or ceilings. Holes in the walls and ceilings will allow fire and smoke to travel throughout the building and cause extensive damage beyond the point of origin. Arrangements must be made to repair the holes using material that is equal or greater than the material of the existing wall. All penetrations through fire walls shall be sealed to afford the same protection as before the penetrations. All trapdoors and scuttle covers shall be kept closed at all times. All missing or damaged ceiling tiles shall be replaced.

**3-13.7.** All required fire walls, partitions and draft stops will be repaired, restored or replaced when damaged, altered, breached or penetrated. If in doubt as to whether a wall is a required, rated separation, contact the fire department for guidance. All required fire doors, fire windows, and fire dampers will be maintained in operable condition as per the original specification.

**3-13.8.** Plans for construction of all new buildings, structures and facilities shall be submitted to the Fire Chief for review at all stages of planning and design. All such plans and design shall include all features of fire protection required by regulations, national fire codes and standards referenced herein.

**3-13.9.** Temporary and mobile facilities shall conform to the same requirements as permanent facilities unless specifically exempted by specific regulation and national fire codes and standards.

**3-13.10.** Where regulations, national fire codes and standards impose more stringent requirements to temporary, mobile and fixed facilities, the more stringent requirements shall apply.

**3-13.11** All new construction and renovation projects shall be subject to a final occupancy inspection conducted by the fire chief's office, before the building can be occupied. Before any building can be occupied, an inspection shall be conducted to ensure that the structure



complies with the latest edition of the national fire codes and standards and referenced regulations. Any building or structure, whether necessitating a physical alteration or not, a change from one occupancy classification to another, or from one occupancy sub-classification to another, shall be inspected to ensure adequate fire protection based on the latest edition of regulations, national fire codes and standards.

**3-13.12.** Whenever carpet is to be used as a floor covering, it shall be specified to meet the following criteria: ***“Class I interior floor finish, critical radiant flux minimum of 0.45 watts per square centimeter.”*** All purchase requests for carpet must be submitted to the fire chief’s office for approval. All purchase requests must have the carpet specification inscribed on the request prior to approval.

**3-13.13.** No interior wall or ceiling finish in any building, structure or facility shall have a flame spread greater than a Class B. No interior wall or ceiling finish in any exit way, place of assembly, computer room and any other area for high value electronic equipment shall have a flame spread greater than Class A.

**3-13.14.** Decorative finishes such as wood paneling that is used to cover the entire wall surface shall be stamped on the back with the following rating: ***Class -A Fire Rated, Flame spread 0-25; smoke developed 0-450.***

### **3-14. INCINERATORS AND OPEN BURNING**

**3-14.1.** Incinerator facilities for burning waste will be maintained in good working condition at all times. Such facilities will cease operations if, in the opinion of the Fire Chief, an unsafe or hazardous condition is caused by their use. Incinerators shall comply with the latest edition of NFPA 82 (Standard on Incinerators).

**3-14.2.** Open burning fires in drums or salamanders used for providing warmth at construction sites, training areas or any other location shall require a written flame permit issued by the fire department. The use of fire to dispose of trash or rubbish is prohibited. Open burning that will be offensive or objectionable due to smoke or odor emissions when atmospheric conditions or local circumstances make such fires hazardous shall be prohibited. Wind gust over 7 miles per hour (MPH) is considered to be a hazardous condition.

**3-14.3.** Open burning for recreational fire and bonfire shall be allowed after obtaining a flame permit from the fire department. Recreational fires and bonfires shall not be conducted within 50 feet of any structure or combustible material unless the bonfire is contained in a barbecue pit. A recreational fire or bonfire shall not be more than 5 feet wide by 5 feet long by 5 feet in height.

**3-14.4.** A bonfire shall consist only of seasoned dry firewood and shall be ignited by using natural combustible material such as kindling or paper.

**3-14.5.** Any open burning, bonfire or recreational fire shall be constantly attended until the fire is extinguished. At least one portable fire extinguisher with a minimum 4-A rating or other approved on-site fire extinguishing equipment, such as dirt, sand, water barrel, or garden hose, shall be available for immediate utilization.

**3-14.6.** Bonfires that are lighted without a permit will be extinguished. The person or persons who are responsible for lighting the bonfire will be charged for the expense in connection with the extinguishment of the fire. Any damage caused or additional cost associated with the illegal bonfire will be charged against the individual or individuals who set the fire.

**3-14.7.** Charcoal grills and other open flame cooking devices shall not be operated on combustible balconies or within 15 feet of any building, structure or vehicle. The distance must be maintained until such device or appliance has cooled to the touch and all fuel is removed. Occupants of residential occupancies shall comply to this regulation and the requirements set forth in the latest edition of APGR 210-8 (Housing handbook).

**3-14.8.** The construction of any barbecue pit or similar structure must be authorized by the Fire Chief. In no case will a barbecue pit or similar structure be installed within 25 feet of any structure.

**3-14.9.** All chimneys used in conjunction with any fireplace or wood stove shall be equipped with a spark arresting screen with opening not larger than one-half inch. Chimneys and the interior walls of fireplaces must be inspected and cleaned by a qualified chimney maintenance and repair company annually. Fireplaces and chimneys found to be unsafe will be repaired as necessary prior to any use or condemned for such use.

## CHAPTER 4

### REQUIREMENTS FOR ELECTRICAL INSTALLATION AND USE

**4-1.** This standard addresses electrical safety requirements for employee workplaces that are necessary for the practical safeguarding of employees in their pursuit of gainful employment.

**4-1.1.** This regulation contains provisions considered necessary for safety. Compliance and proper maintenance will result in an installation essentially free from hazards but not necessarily efficient, convenient, or adequate for good service or future expansion. Hazards often occur because of overloading of wiring systems by methods or usage not in conformity of the National Electrical Code(NEC) or with this regulation.

**4-1.2.** The Fire Chief and or his representative is the authority having jurisdiction in enforcing the compliance set forth in the NEC and this regulation. The fire chief's office will provide technical assistance, when requested, in the interpretation of the NEC and this regulation.

**4-1.3.** Electrical equipment and appliances will only be used for the purposes for which they were designed by the manufacturer and operated in accordance with manufacturer's instructions. Improvised electrical wiring, fabricating, or modifying of electrical equipment or appliances is prohibited, except by authorized agents through an approved testing or research projects requiring the fabrication of electrical equipment necessary to conduct the project. The modification of an appliance or equipment can only be accomplished by an authorized agent of the manufacturer.

**4-1.4.** All electrical appliances used on this installation shall carry a label from a recognized testing laboratory such as Underwriters Laboratories (UL) or Factory Mutual (FM) Laboratories, or any other nationally recognized testing laboratory. Listed or labeled equipment shall be installed, used, or both, in accordance with any instructions included in the listing or labeling.

**4-1.5.** Working Space. The minimum clear working space in front of electrical equipment such as switchboards, control panels, fuse panels, circuit breakers, motor control, relays, and similar equipment shall not be less than three (3) feet. Distance shall be measured from the live parts, if exposed, or from the enclosure front or opening, if enclosed.

**4-1.6.** Marking of circuit breakers and fuse panels. Every fuse or circuit breaker shall be clearly marked for its intended use. When there are spare fuses or circuit breakers in an electrical panel, the fuse or breaker must be clearly marked "SPARE."

**4-1.7.** Electrical rooms or vaults will not be used for general storage.

**4-1.8.** Electrical cable shall be adequately protected against physical damage. All permanent electrical wiring must be installed in conduit, inside walls or through raceways.

**4-1.9.** Cover Plates. Cover plates shall be installed on all receptacles, light switches, pull and junction boxes, conduit bodies, fittings, relays, electrical panels, electrical

appliances, and any other type of electrical box. Covers shall be a minimum  $\frac{1}{32}$  inch (0.79mm) or shall be listed for the purpose.

**4-1.10.** Unused openings. Unused opening in boxes, conduit bodies, and fittings shall be effectively closed to afford protection substantially equivalent to that of the wall of the box, conduit body and fitting. Metal plugs or plates used with nonmetallic boxes, conduit bodies, or fittings shall be recessed at least  $\frac{1}{4}$  inch (6.35mm) from the outer surface. An example of an unused opening is a circuit breaker that has been removed from an electrical panel. The unused opening, where the breaker was, must have a blank plate installed to protect occupants from the live parts.

## **4-2. FLEXIBLE CORDS**

**4-2.1.** All flexible cords will conform to specifications published in the latest edition of the National Electrical Code (NEC). Flexible cords to be used will be one continuous length without taps or splices.

**4-2.2.** Permissible uses of flexible cords. Flexible cords and cables shall be used only for the following:

- (a) Pendants
- (b) Wiring of fixtures
- (c) Connection of portable lamps or appliances
- (d) Elevator Cables
- (e) Wiring of cranes and hoists
- (f) Connection of stationary equipment to facilitate their frequent interchange
- (g) Prevention of the transmission of noise or vibration
- (h) Appliances where the fastening means and mechanical connections are specifically designed to permit ready removal for maintenance and repair, and the appliance is intended or identified for flexible cord connection.
- (i) Data Processing cables
- (j) Temporary wiring not to exceed 90 days.
- (k) be connected directly into a receptacle through an attachment plug.
- (l) All live parts to the flexible cord, including the attachment plug, shall be adequately protected.

**4-2.3.** Flexible cords will not be:

- (a) Used as a substitute for fixed wiring.
- (b) Run through holes in walls, ceilings, or floors.
- (c) Run through doorways, windows, crawl spaces, or similar openings, except when the cords are used with portable equipment such as hand tools, floor polishers, vacuum cleaners, etc. Flexible cords will never be left at such location after the work has been completed.
- (d) Run under rugs
- (e) Run across floors without protection from pedestrian traffic.
- (f) Subjected to electrical loads in excess of the rated capacity of the flexible cord.
- (g) Wrapped around pipes or other metal objects.
- (h) Subjected to excessive heat or chemical vapor that would break down the insulation on the cord.

**4-2.4.** Splices. Flexible cord shall be only in one continuous length without splice or tap where initially installed in an application as permitted in Section 4-2.1. The length of the cord shall kept to a minimum to avoid coiling.

**4-2.5.** Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlets boxes, or similar enclosures.

**4-3. EXTENSION CORDS**

**4-3.1.** Extension cords are permitted only for temporary use with portable equipment, and then only under the following conditions, in additions to the requirements for permanently attached flexible cords listed above.

- (a) While portable equipment supplied by the extension cord is actually being used. Extension cords must be unplugged and removed when not in use.
- (b) When the extension cord and its plug attachment are in a safe condition, and the cord is without splices or repairs.
- (c) The attachment plug is a three-pronged grounded type.

**4-3.2.** Extension cord will not be used routinely in lieu of permanently wired receptacles.  
**Exceptions:** An extension cord with multi-outlets, provided with surge protection, and has an in-line circuit breaker is permitted to be used at all times.

**4-3.3.** Extension cords must be rated for its intended use or purpose.

**4-3.4.** Extension cord wiring shall be rated at a No. 16 AWG (American Wire Gauge) or larger.

**4-3.5.** Extension cords used on this installation shall carry a label from a recognized testing laboratory such as Underwriters Laboratories (UL) or Factory Mutual (FM) Laboratories, or any other nationally recognized testing laboratory.

**4-3.6.** The use of an extension cord with a heat-producing device such as a coffeemaker, microwave oven, electric space heater, toaster oven, hot plate, curling iron and similar appliance is prohibited.

#### **4-4. RECEPTACLES**

**4-4.1.** All receptacles shall have a cover plate in position at all times.

**4-4.2.** Replacement receptacles. All non-grounding receptacles shall be replaced with grounding-type receptacles, providing the electrical panel and the outlet boxes are grounded.

**4-4.3.** Ground-Fault Circuit-Interrupter receptacle shall be installed as a replacement in a non-grounding electrical system. Exception: ground fault circuit interrupter breaker may be installed. However, receptacles must be marked (GFCI) protected.

**4-4.4.** The use of cube taps or similar devices that allow more attachment plugs to be plugged into an outlet is prohibited.

**4-4.5.** When renovation projects consist of 50 percent or more of the building, the renovation project must make provisions to install a receptacle outlet so that at no point along the floor line any wall space is more than 8 feet, measured horizontally, from an outlet. Receptacle shall be installed on every wall in a normally occupied area.

**4-4.6.** Receptacles installed in hazardous areas shall be listed as explosive proof. The fire chief's office will assist in determining what areas are considered to be hazardous.

**4-4.7.** Receptacles that are installed outside or in moist areas shall be protected by a ground fault circuit interrupter (GFCI).

**4-4.8.** Receptacles above a wet bar, sink, or any type of wet location above a counter top surface, regardless of occupancy use, shall be protected by a ground fault circuit interrupter.

#### **4-5. ELECTRICAL APPLIANCES**

**4-5.1.** All electrical appliances must carry a label signifying that they have been tested by a nationally recognized testing laboratory.

**4-5.2.** Electrical cords must be positioned to eliminate the possibility of tripping and upsetting the appliance by contact with the cord. Appliances must be connected directly to an electrical outlet, or a multi-outlet extension equipped with an in-line circuit breaker.

**Exception:** A regular extension cord may be used as temporary wiring for the use of portable electrical tools. However, the appliance and the extension cord must be unplugged after each use.

**4-5.3.** Electrical appliances that have frayed, broken insulation, or where the insulation has been pulled away from the attachment plug, exposing live wires, will be sufficient cause for condemnation of the entire unit from use. Occupants must make arrangements for a qualified manufacturer service representative to replace the cord or discard the appliance.

**4-5.4.** Electrical appliances will not be placed in a desk drawer, wall locker, closet or other similar device while in use.

**4-5.5** The use of electric skillet, hot plate, toaster oven, toaster, household deep fat fryer, pressure cooker, crock pot, coffeemaker, or any other similar device used for cooking is prohibited in individually assigned rooms in student barracks.

**Exception:** Permanent party individuals who are housed in individual-assigned rooms may use a coffeemaker that will automatically turn off, or where a coffeemaker brews directly into a thermal container without the use of a hot plate. The electrical appliances listed above may be used in designated kitchen areas in barracks, efficiency apartments, housing areas, or any other designated area that has been approved by the fire department.

**4-5.6.** All heat-producing electrical appliances shall be placed on a non-combustible surface. Ensure that there is adequate air circulation under the appliance. The use of combustible material such as paper towels, paper, or tablecloths, under a heat-producing device is prohibited.

**4-5.7.** The use of a coffeemaker with a built-in timer is prohibited throughout the installation, except for family housing units, such as one-and two-family dwellings, apartments, and efficiency apartments.

**4-5.8.** Electric ovens, furnaces, hot plates, kilns, and similar heating appliances for use in laboratories or testing programs will be approved by Underwriters' Laboratories (UL) , Factory Mutual Laboratories (FM), or other nationally recognized testing laboratories.

**4-5.9.** Portable space heaters are to be used only as a last resort for heat. Portable electric space heaters shall carry the marks of Underwriters Laboratory (UL) or Factory Mutual (FM) listing. Electric space heater shall be equipped with a safety tip over switch and be plugged directly into a wall outlet - **THE USE OF EXTENSION CORDS IS PROHIBITED.**

**4-5.10.** The electric space heater shall be positioned in a way where there is at least 36 inches in clear width around a space heater. The area around the heater shall be free of all combustibles. The use of portable space heater under a desk is prohibited.

**4-5.11.** A minimum clearance of 30 inches of clear width shall be maintained in front of electrical panels.

**4-5.12.** Electrical circuit breaker panels that are installed in hallways/corridors or rooms that are accessible to building occupants, and serve as a disconnecting means for equipment, electrical outlets, and lighting circuits, shall be unlocked at all times.



## CHAPTER 5

### HANDLING OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

**5-1.** The intent of this chapter is to define and apply standards for the handling, storage and use of combustible and flammable liquids according to the national fire codes and federal regulations. More stringent requirements may be set forth in this regulation.

**5-1.1** Additional requirements may be necessary for the safe storage and use of the liquids which have unusual characteristics, which are subject to self-ignition when exposed to the air, which are highly reactive with other substances, which are subject to explosive decomposition, or have other special properties which dictate safeguards over and above those specified for a normal liquid of similar flash point classification. In such case, safeguards shall be as specified by the Fire Chief or his representative.

**5-1.2.** Classification and Definition of Liquids. Any liquid within the scope of this regulation and subject to the requirements of this regulation shall be known generally as either a flammable liquid or a combustible liquid and shall be defined and classified in accordance with this subsection.

**5-1.2.1** Flammable Liquid. Any liquid that has a closed-cup flash point below 100°F (37.8° C), as determined by National testing laboratories. Flammable liquids will be also be defined in this chapter as a Class I liquid.

**5-1.2.2** Combustible Liquid. Any liquid that has a closed-cup flash point above 100° F (37.8° C), as determined by national testing laboratories. Combustible liquids will be also be defined in this chapter as a Class II liquid.

**5-1.2.3.** All tanks and containers containing combustible and flammable liquids shall be clearly marked as to the contents in accordance with referenced codes and standards and as required herein.

**5-1.2.4.** In locations where flammable vapors may be present, precautions will be taken to prevent ignition or controlling sources of ignition. All electrical wiring and equipment used in the vicinity of flammable or combustible liquid storage shall be installed in accordance with Article 500 of the National Electrical Code (NEC).

**5-1.2.5.** Any solvent dip tanks used for cleaning parts shall be of an approved design as specified by the AHJ. All solvent tanks shall be equipped with a self-closing lid or one that is designed to automatically close upon the activation of a fusible link. Only approved combustible solvent or environmental safe solvent shall be used.

### 5-2. TANK STORAGE DESIGN AND CONSTRUCTION

**5-2-1.** Tanks shall be designed and built in accordance with recognized good engineering standards for the material of construction being used and shall be of steel or approved noncombustible material, with the following limitations and exceptions:

(a) The material of tank construction shall be compatible with the liquid to be stored. In case of doubt about the properties of the liquid to be stored, the supplier, producer of the liquid, or other competent authority shall be consulted.

(b) Tanks constructed of combustible material shall be subject to the approval of the AHJ and limited to:

1. Use where required by the properties of the liquid stored, or
2. Storage of Class IIIB liquids above ground in areas not exposed to a spill or leak of Class I or Class II liquid, or
3. Storage of Class IIIB liquids inside a building protected by an approved automatic extinguishing system, or
4. Stored in containers with a capacity of 5 gallons or less. Container must be approved by the Fire Chief or his representative for use of Class I liquids.

**5-2.2.** All permanent and temporary installation of above ground tanks shall be installed in accordance with UL 142 (combustible) and UL 2085 (flammable). All other installation specifications, shall comply with the latest edition of Code of Maryland (COMAR) 26.10 and Title 40 of the Code of Federal Regulations (CFR).

### **5-3. PIPING, VALVES AND FITTINGS**

**5-3.1.** Piping systems shall be maintained liquid tight. A piping system that has leaks that constitute a hazard shall be emptied of liquid or repaired in a manner acceptable to the fire chief's office.

**5-3.2.** Pipes, valves, facets, couplings, flexible connectors, fittings, and other pressure-containing parts shall meet the specifications as outlined in the latest edition of NFPA 30, Code of Maryland Regulation (COMAR 26.10). Plastic or similar materials, as permitted further in this regulation, shall be designed to specification embodying recognized engineering principles or shall be listed, and shall be compatible with the fluid service.

**5-3.3.** Valves at storage and their connections to the tank shall be steel or nodular iron except as outlined in 5-3.4.

**5-3.4.** Valves at storage tanks shall be permitted to be other than steel or nodular iron where the chemical characteristics of the liquid stored are not compatible with steel or where installed internally to the tank. Where installed externally to the tank, the material shall have a ductility and melting point comparable to steel or nodular iron so as to withstand reasonable stresses and temperatures involved in fire exposure or otherwise be protected, such as by materials having a fire resistance rating of not less than 2 hours.

**5-3.5.** Cast iron, brass, copper, aluminum, malleable iron, and similar materials shall be permitted to be used on tanks that contain crude petroleum product, having a flash point above 200 degrees.

**5-3.6.** Low melting point materials that soften in a fire (aluminum, copper, brass, plastic, cast iron, etc.) shall be permitted to be used underground for all liquids within the limits of ANSI B31, *American National Standard Code for Pressure Piping*. If such materials are used outdoors in above-ground piping systems handling Class I, Class II or Class IIIa liquids or within buildings handling any liquid they shall be either: (a) resistant to damage by fire, b) located that any leakage resulting from the failure will not unduly expose persons, building, or structures, or (c) located where leakage can readily be controlled by operation of an accessible remotely located valve(s).

**5-3.7.** Piping, valves, and fittings shall be permitted to have combustible or noncombustible linings.

**5-3.8.** Nonmetallic piping, including piping systems incorporating secondary containment, shall be built in accordance with recognized standards or designed or approved equivalents and shall be installed in accordance with 5-3.6. Nonmetallic piping shall be built, installed, and used within their scope of approvals or within the scope of Underwriter Laboratories Inc., *Standard for Nonmetallic Underground Piping for Flammable Liquids*, UL971.

**5-3.9.** Joints shall be made liquid tight and shall be either welded, flanged, or threaded, except that listed flexible connectors shall be permitted to be used where installed in accordance with 5-3.10. Threaded joints shall be made up tight with suitable thread sealant or lubricant. Joints in piping systems handling Class I liquids shall be welded when located in concealed spaces within buildings.

**5-3.10.** Pipe joints dependent upon friction characteristics or resiliency of combustible materials for mechanical continuity or liquid tightness of piping shall not be used inside buildings. They shall be permitted to be used outside of buildings above ground or below ground. If used above ground outside of buildings, the piping shall either be secured to prevent disengagement at the fittings, or the piping system shall be designed that any spill resulting from disengagement could not unduly expose persons, buildings, or structures and could be readily controlled by remote valves.

## **5-4. SUPPORTS**

**5-4.1.** Piping systems shall be substantially supported and protected against physical damage and excessive stresses arising from settlement, vibration, expansion, or contraction. The installation of nonmetallic piping shall be in accordance with manufacturer's instruction.

**5-4.2.** Load bearing piping supports that are located in areas with a high fire exposure risk shall be protected by one or more of the following:

- (a) Drainage to a safe location to prevent liquid from accumulating under pipeways
- (b) Fire-resistive construction
- (c) Fire-resistive protective coating or systems
- (d) Water spray systems designed and installed in accordance with the latest edition of NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*
- (e) Other alternate means acceptable to the AHJ.

## 5-5. PROTECTION AGAINST CORROSION

**5-5.1.** All piping systems for liquids, the underground piping system shall be protected by either:

(a) Properly engineered, installed, and maintained cathodic protection system as described the American Petroleum Institute Publication 1632.

(b) Approved or listed corrosion-resistant materials or systems, which can include special alloys, fiberglass reinforced plastic, or fiberglass reinforced plastic coating.

**5-5.2.** Selection of the type of protection to be employed shall be based upon the corrosion history of the area and the judgment of a qualified engineer. The AHJ can waive the requirements for corrosion protection where evidence is provided that such protection is not necessary.

## 5-6. UNDERGROUND PIPING

**5-6.1.** In areas subject to vehicle traffic, the trench shall be sufficient depth to permit a bedding of at least 6 inches of well-compacted backfill material and shall be covered with at least 18 inches of well compacted backfill material and pavement. In areas not subject to vehicle, the piping shall be provided with a cover of at least 6 inches of well compacted material. A greater burial depth shall be provided when required by the manufacturer's instructions or when frost conditions are apparent.

**5-6.2.** Piping within the same trench shall be separated as follows:

- (a) Two diameters between lines
- (b) Piping need not be separated by more than 9 inches

**5-6.3.** Two or more levels of pipes within the same trench shall be separated by a minimum 6 inches of well compacted backfill.

## 5-7. MARKING OF ABOVE-GROUND STORAGE TANKS

**5-7.1.** All tanks shall be labeled to identify the product and the amount being stored. Example: Contents - Fuel Oil, 275 gallons.

**5-7.2.** Storage containing combustible material (flash point above 100 degrees) shall be marked: **NO OPEN FLAME WITHIN 15 FEET**. Storage tanks containing flammable liquids (Flash point below 100 degrees) shall be marked: **NO OPEN FLAME WITHIN 50 FEET**. The size of the letter shall be a minimum of 3 inches in height, and the stroke of the letter shall be no less than 1/2 inch.

**5-8. PLACEMENT OF ABOVE-GROUND STORAGE TANKS.** A minimum distance of 5 feet must be maintain from any building or structure. The fire chief's office will determine the minimum distance requirement as determined by the capacity of the storage tank.

## **5-9. CONTAINER AND PORTABLE TANK STORAGE INSIDE BUILDINGS**

**5-9.1.** Container refers to any drum or other vessel with a capacity of 60 gallons or less.

**5-9.2.** Portable tank refers to tanks or vessels with a capacity exceeding 60 gallons but not more than 660 gallons and not intended for fixed installation.

**5-9.3.** Materials which will react with water or other liquids to produce a hazard shall not be stored in the same room with flammable or combustible liquids.

**5-9.4.** The storage of empty tanks or containers previously used for the storage of flammable or combustible liquids, unless free of explosive vapors, shall be as specified for the storage of flammable liquids. Tanks and containers when emptied shall have the covers or plugs immediately replaced in the openings.

**5-9.5.** Flammable and combustible liquids shall not be stored or used near an exit, doorways, stairways, or in any other location that would hinder the means of egress.

**5-9.6.** Flammable and combustible liquid storage shall be limited to the quantities and conditions listed for each occupancy as follows unless stored in flammable liquid storage rooms or buildings with installed fire protection in accordance with the latest edition of NFPA 30, NFPA 30-A, and NFPA 30-B.

**5-9.7.** Storage of flammable liquids in assembly occupancy (churches, child care centers, theaters, etc.) is prohibited.

**5-9.8.** Storage of flammable liquids is prohibited in residential occupancies (motels, dormitories, BEQs, and BOQs). Exception: Flammable and combustible liquids may be stored in garages, outside storage rooms, or in approved flammable liquid cabinets which are not in the living area of the dwelling unit.

**5-9.9.** Educational, institutional and office occupancies are limited to that amount required for maintenance, operations, demonstration, treatment and laboratory work. Quantities up to five gallons must be stored in a metal cabinet. Any quantity in excess of five gallons shall be stored in an approved flammable liquid cabinet. Each flammable liquid cabinet shall be limited to a maximum capacity of 45 gallons.

**5-9.10.** Industrial occupancies are limited to one week's requirement. All quantities up to five gallons shall be stored in a metal cabinet. Any quantity in excess of five gallons shall be stored in an approved flammable liquid cabinet. Each flammable liquid cabinet shall be limited to a maximum capacity of 45 gallons. Not more than three storage cabinets shall be stored in one fire area.

**Exception:** In industrial occupancies, additional storage cabinets shall be permitted to be located in the same fire area, providing a separation of 100 feet is maintained between each group of not more than three cabinets.

**5-9.11.** Mercantile occupancies (RE-NU-IT Center, PX, Office Eagle Store, Shipping and Receiving) are limited to a maximum of two gallons per square foot of area actually

occupied by such display or storage. Exception: Storage of flammable liquids is prohibited in basements or on floors other than the ground floor.

## **5-10. GENERAL STORAGE REQUIREMENTS (WAREHOUSE)**

**5-10.1.** The storage of any liquids shall not physically obstruct any means of egress.

**5-10.2.** Where storage on racks exists as permitted by this regulation, a minimum four (4) feet wide aisle shall be provided between adjacent rack sections and any adjacent storage of liquids. Main aisleways in warehouse shall be a minimum of 8 feet wide.

**5-10.3.** Solid piles and palletized storage in liquids warehouses shall be arranged so that piles are separated from each other by at least 4 feet. Aisles shall be provided and so arranged that no container or portable tank is more than 20 feet from an aisle.

**5-10.4.** Storage of empty or idle combustible pallets inside an unprotected liquid storage area shall be limited to a maximum size of 1000 feet and to a maximum storage height of 6 feet.

**5-10.5.** Containers in piles shall be stacked in such a manner as to provide stability and to prevent excessive stress on container walls. Portable tanks stored over one tier high shall be designed to nest securely, without dunnage.

**5-10.6.** Containers or portable tanks in unprotected liquid storage areas shall not be stored closer than 36 inches to the nearest beam, cord, girder, or other roof member.

**5-10.7.** Wood at least 1 inch thick shall be permitted to be used as shelving, racks, dunnage, scuffboards, floor overlay and similar installation.

## **5-11. USE, DISPENSING AND MIXING**

**5-11.1.** Flammable liquids shall be used only where there are no open flames or ignition sources within the possible path of vapor travel.

**5-11.2.** Dispensing of flammable and combustible liquids within a building shall be limited to rooms or areas approved for such operations and shall be from:

- (a) Original shipping containers of five gallons or less capacity, or
- (b) Approved safety cans, or
- (c) Through a closed piping system, or
- (d) A container by means of a device drawing through an opening in the top of the container, or
- (e) A drum by gravity through a listed self-closing valve or faucet.

**5-11.3.** Electrical bonding of all containers involved in transfer operations shall be accomplished prior to commencement of any transfer and shall remain in place until after completion of such transfer.

**5-11.4.** Flammable or combustible liquids shall not be dispensed by a device that operates through pressure within a storage tank or container, unless the tank or container has been approved as a pressure vessel.

**5-11.5.** Containers or vessels shall be electrically bonded by wires, piping or similar means where differences of potential could otherwise be created by the accumulation of static electricity charges.

**5-11.6.** Provisions shall be made to prevent flammable or combustible liquids which may be spilled at loading or unloading points from entering public sewer and draining systems or natural waterways. Connections to such sewers, drains or waterways by which flammable or combustible liquids might enter shall be provided with separator boxes or other approved means whereby such entry is precluded. Crankcase draining and flammable or combustible liquids shall not be dumped into sewers but shall be stored in tanks or tight drums outside of any buildings until removed. Every effort will be made to remove drums in a timely manner.

## CHAPTER 6

### SPECIAL OCCUPANCY USES

**6-1. Intent.** The intent of this chapter is to prescribe additional fire safety requirements based on the occupancy use that is determined beyond the minimum requirements of Chapter 2 through 5. The following additional requirements shall apply to the following occupancy use:

#### **6-2 PLACES OF ASSEMBLY**

**6-2.1.** Places of assembly will only be operated in buildings or places designated unless specific approval is obtained from the Fire Chief.

**6-2.2.** All loose seats, folding chairs or similar seating shall be banded together in groups of not less than three where such seating is used to seat in excess of three hundred persons in a single room. Space of seating shall be in accordance with the latest edition of NFPA 101 (Life Safety Code).

**6-2.3.** Where smoking is permitted, there shall be provided on each table and at other convenient locations an approved noncombustible ashtray able to hold at least one pack of cigarette butts.

**6-2.4.** Every place of assembly shall be under the constant supervision of a competent adult trained in the evacuation procedure. Every attendant, employee, operator or manager of any place of assembly shall receive training annually in fire prevention measures, fire evacuation procedures, fire extinguishers, and fixed extinguishing systems that are unique to their occupancy use.

**6-2.5.** Decorative material such as drapes, hangings, curtains, drops, partitions, wreaths, streamers, and any other decorative material shall be fire retardant. All hand-crafted decorations displayed in any place of assembly must be flame retardant.

**6-2.5.1.** Decorative material will not be displayed in a way that would obstruct or block any fire alarm pull station, fire extinguishers, sprinkler heads, exit lights, and exit doors.

**6-2.5.2.** Live Christmas trees and live green cuttings are prohibited in assembly occupancies.

**6-2.5.3.** Combustible decorative material (e.g. cotton batting, straw, dry vines, leaves, or cornstalks) or other highly combustible material shall not be used in any building.

**6-2.6.** All exits and access to exits shall be maintained in a usable condition at all times while the building is occupied. Blocking or locking exits during periods of use shall be cause for immediate closing of that facility.

**6-2.7.** All places of assembly must display a Maximum Occupancy permit. Calculations of maximum occupant load shall be determined by representatives of the Fire and Emergency Services Division. Occupancy loads that have been calculated based on individual rooms, shall have the occupancy permit conspicuously posted in each room. It is



the responsibility of the facility manager to ensure that all occupancy permits are posted at all times the facility is occupied.

**6-2.7.1.** Where fixed seating is used, the maximum occupant load shall be the number of seats. Standing room is prohibited in aisleways and along walls in fixed-seating arrangements.

**6-2.7.2.** Managers and attendants shall be responsible for assuring that the maximum occupant limits are not exceeded. In facilities that have flexible floor plans, occupancy limits will be posted for three uses: banquet, meeting and cabaret.

**6-2.7.3.** When a large crowd is anticipated, the facility manager or the user shall provide the fire chief's office with a floor plan, indicating seating arrangements, width of aisleways, and location of exit for approval. An approved copy of the floor plan shall be kept on display on the premises.

**6-2.8.** No open flame will be permitted in any public assembly, drinking or eating establishment, except when used in conjunction with approved heating or cooking appliances. Any other use of open flame or pyrotechnic device used for theatrical performances must obtain a written permit from the fire chief's office.

### **6-3. CANDLES**

**6-3.1.** A person shall not utilize or allow to be utilized, any open flame, burning candle or candles in connection with any public meeting or gathering for purposes of deliberation, instruction, worship, entertainment, amusement, education, recreation, awaiting transport or similar purpose in assembly or educational occupancies without first obtaining a permit or permission from the Fire and Emergency Services Division.

**6-3.2.** Candles and other open-flame decorative devices shall comply with the following:

- (a) Class I and Class II liquids and LP-gas shall not be used.
- (b) Liquid or solid fueled lighting devices containing more than 8 ounces must self extinguish and not leak fuel at a rate of more than 0.25 teaspoon per minute if tipped over.
- (c) The devices or holder shall be constructed to prevent the spillage of liquid fuel or wax at the rate of more than 0.25 teaspoon per minute when the device or holder is not in an upright position.
- (d) The device or holder shall be designed so that it will return to the upright position after being tilted to an angle of 45 degrees from vertical.

**Exception:** Units that self-extinguish if tipped over and do not spill fuel or wax at the rate of more than 1/4 teaspoon per minute if tipped over.

- (e) The flame shall be enclosed except where openings on the side are not more than 3/8 inch diameter or where opening on the top and the distance to the top is such that a piece of tissue paper placed on the top will not ignite in 10 seconds.

(f) Chimneys shall be made of noncombustible materials. Such chimneys shall be securely attached to the open-flame device.

**Exception:** The chimney is not required to be attached to any open-flame device that will self-extinguish if the device is tipped over.

(g) Shades, if used, shall be made of noncombustible materials and securely attached to the open-flame device holder or chimney.

(h) Candelabras with flame-lighted candles shall be securely fastened in place to prevent overturning and located away from possible contact with drapes, curtains or other combustibles.

**6-3.3.** Open flames such as from candles, lanterns, and gas-fired heaters shall not be located on or near decorative material or other similar combustible materials.

**6-3.4.** Candles shall not be permitted in areas where occupants stand, or in aisle or exit.

**6-3.5.** Participants in religious ceremonies are allowed to carry handheld candles. Handheld candles shall not be passed from one person to another while lighted.

#### **6-4. OUTDOOR CONCERTS**

**6-4.1.** A fenced outdoor assembly occupancy shall have at two widely separated exits from the enclosure. If more than 6,000 persons are to be served by such means of egress, there shall be at least three exits. If more than 9,000 persons are to be served, there shall be at least four exits.

**6-4.2.** Exits shall be located remotely from each other and shall be arranged to minimize the possibility that they might be blocked by any emergency. At least one of the exits shall be designed or arranged to provide access to emergency vehicles.

**6-4.3.** Access and egress routes shall be maintained so that any individual is able to move without undue hindrance, or personal initiative and at any time, from an occupied position to exits. Access and egress routes shall be maintained so that crowd management, security, and emergency medical personnel shall be able to move without undue hindrance at any time to any individual.

**6-4.4.** The width of accessways and aisles shall be determined by the amount of patrons attending a particular concert. The fire chief's office will calculate the required widths of aisleways and accessways. All calculations will be based on the amount of advance ticket sales.

**6-4.5.** At outdoor concerts having more than 1,000 persons, a trained crowd or crowd manager supervisors at a ratio of 1 crowd manager/supervisor for every 250 people. The crowd manager/supervisor shall have received approved training in crowd management techniques.

**6-4.6.** Concert organizers shall provide a tent at the concert site to be used as an emergency First Aid Station. The tent shall be equipped with cots, chairs, and temporary electric lighting.

**6-4.7.** Portable fire extinguishers shall be placed near each open flame device in food preparation area. The fire department will provide the fire extinguishers and place them in the appropriate location. It is the responsibility of the concert organizers to return the fire extinguishers after each concert.

**6-4.8.** Concert organizers will prepare and submit to the fire chief's office a sketched floor plan indicating food preparation areas, emergency exits, handicapped accesses, first aid stations, stages, stage-supported areas and structures, and any other important detail connected to the concert.

## **6-5. BOWLING ALLEYS**

**6-5.1.** Bowling Alleys shall conform to all national codes and standards referenced herein as well as the following requirements:

**6-5.2.** Bowling pin refinishing or bowling alley resurfacing shall require a written permit from the Fire and Emergency Services Division.

**6-5.3.** Alley resurfacing and refinishing operations shall not be carried on while the establishment is open for business. The Fire and Emergency Services Division shall be notified when the work is started and completed.

**6-5.4.** To prevent the accumulation of flammable vapors, mechanical ventilation at a minimum rate of 1 cubic foot per minute per square foot of area being finished shall be provided. Such exhaust shall be by approved temporary or portable means. Vapors shall be exhausted to the exterior of the building.

**6-5.5.** Heating and air-conditioning systems shall not be operating during resurfacing or refinishing operations or within four hours of the application of flammable or combustible liquids.

**6-5.6.** The power to all electrical devices shall be shut down to all electrical sources of ignition within the vapor area, unless those devices are classified for use in Class 1, Division 1 hazardous locations.

**6-5.7.** Sanding and buffing machines shall be provided with an approved dust-collection system. The collection of dust shall be removed daily and disposed of in an outside receptacle.

**6-5.8.** A self-closing noncombustible waste can shall be provided for the collection of waste rags and material. The content of the waste can shall be disposed of daily.

**6-5.9.** Smoking is prohibited at all times in pin refinishing rooms or while resurfacing the alleys.

**6-5.10.** All flammable and combustible liquids shall be stored in an approved flammable liquid cabinet.

## **6-6. GARAGES AND STORAGE SHEDS**

**6-6.1.** Garages and storage sheds shall be used for the sole purpose of general storage.

**6-6.2.** No storage shed or garage will be used for the purpose of rebuilding internal combustion engines unless assigned for that purpose or approved by the Fire Chief in writing.

**6-6.3.** No storage shed or garage will be used as an office. Installed electricity in storage sheds shall be limited to overhead lighting.

**6-6.4.** Any alteration on a garage or storage shed must be approved by the fire department in writing.

## **6-7. TENTS AND AIR SUPPORTED STRUCTURES**

**6-7.1.** All temporary tents, air-supported, air-inflated, tensioned membrane structures and canopies, shall comply with the following:

(a) A detailed site and floor plan for tent, air-supported, air-inflated, tensioned membrane structure or canopy, with an occupant load of 50 or more people shall be provided to the fire department for a written approval. The floor plan shall indicate details of the means of egress, seating capacity, arrangement of the seating and location and type of heating and electrical equipment. A written application for permit must be submitted to the fire department prior to erection of such facilities.

(b) Vehicles and internal combustion engines shall not be parked or placed within 20 feet of any tent or air-supported structure without approval of the Fire Chief.

(c) Tents or air-supported structures and the appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather against collapsing. All anchors shall be inspected regularly and adjusted or repaired immediately to ensure a secure base attachment and seal. Provisions shall be made to install yellow caution tape on anchor ropes. Tape should be placed at eye level to provide best visibility.

**Exception:** tents used in tactical training are not required to mark the anchor ropes.

(d) The side walls, drops and tops of all tents and air-supported structures shall be made of flame retardant material. All dividers, decorations, furnishing and floor coverings shall also be made of flame retardant material.

(e) Tent belonging to any circus, carnival, traveling show, or other commercial activity entering or doing business on the installation shall be flame retardant. A written certification must be provided to the Fire Chief for acceptance prior to use. The certification shall include as a minimum the following :

- (1) Names and address of the owners of the tent or air-supported structure.
- (2) Date the fabric was last treated with flame-resistant solution.
- (3) Trade name or kind of chemical used in treatment.
- (4) Name of person or firm treating the material.
- (5) Name of testing agency and test standard by which the fabric was tested.

(f) Membrane structures, tents or canopies shall have permanently affixed label bearing the identification of size and fabric or material type.

(g) Smoking and open flames shall be prohibited in all tents and air-supported structures unless specifically permitted in writing by the Fire Chief.

(h) The fire chief's office must approve all heating or cooking equipment prior to use. Appliances that are covered in the latest edition of the Technical Manual (TM) will automatically be granted approval, providing they are used as outlined in the TM.

(i) Flammable or combustible liquids shall not be stored in any tent or air-supported structure used for human occupancy including office, shop, break area, or similar occupancy.

(j) Hay, straw, shavings or similar combustible material shall not be located within any tent or air-supported structure containing an assembly occupancy, except the material necessary for the daily feeding and care of animals. Sawdust and shavings utilized for public performance or exhibit may be used provided the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time.

(k) The areas within and adjacent to the tent or air-supported structure shall be maintained free of all combustible material or vegetation which will create a fire hazard within 35 feet unless specifically permitted by the Fire Chief.

(l) All combustible trash shall be removed at least once a day from the structure during the period the structure is occupied by the public.

(m) Fireworks shall not be permitted within 200 feet of tents, air-supported, air-inflated or tensioned membrane structures.

(n) Tents used for sleeping purposes shall be erected and occupied in accordance with the latest edition of the military Technical Manual for tactical training.

## **6-8. LUMBERYARDS AND WOODWORKING FACILITIES**

**6-8.1.** Provision shall be made for systematic, thorough cleaning of all woodworking shops at sufficient intervals to prevent the accumulation of finely divided wood dust that might be dislodged and could lead to an explosion.

**6-8.2.** All powered-cleaning equipment, such as sweepers or vacuum cleaners, used in dusty areas shall be approved for Class II, Division I, Group G locations as defined in Article 500 of NFPA 70, *National Electrical Code*.

**6-8.3.** The use of compressed air or other similar means to remove dust accumulations

from areas that are not readily accessible such as the grooves in masonry walls and overhead lighting, for cleaning by other methods shall be permitted only if done frequently enough to prevent hazardous concentrations of dust in suspension.

**6-8.4.** All cutting, shaping, planing and sanding, or other machines that produce finely divided wood dust or shavings shall be provided with a dust pickup, dust-conveying, and dust-collection system.

**6-8.5.** All woodworking facilities shall be designed and equipped with a complete dust collection system. The dust collection system shall be engineered with floor hoods or enclosures and located where the wood dust or shaving generated will fall, be projected, or be drawn into the hood or enclosure.

**6-8.6.** The collection of static dust through portable dust collection systems shall be dumped in frequent intervals outside of the building.

**6-8.7.** Static electricity shall be prevented from accumulating on machines and equipment subject to static electricity buildup by permanent grounding and bonding wires or other approved means.

**6-8.8.** Smoking shall be prohibited in all lumber yards and woodworking buildings except in specific locations designated as safe for smoking purposes.

**6-8.9.** Debris such as sawdust, wood chips, shorts and other similar small pieces of wood shall be removed from the building on a regular basis. Scrap lumber will not be allowed to accumulate in woodworking area. Good housekeeping shall be maintained at all times.

**6-8.10.** All piles of lumber shall be stacked in a stable manner and not exceed 15 feet in height. Driveways between and around lumber piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment or other articles or materials. Outside lumber storage areas shall be placed on an all-weather surface providing access to fire apparatus to all areas of the yard. Stored materials of any kind shall not be permitted to obstruct access to fire hydrants, yard hydrants or be placed in a manner that would interfere with fire fighting activities.

**6-8.11.** Vegetation such as grass and weeds shall be kept short for at least 25 feet around lumber storage yards throughout the year.

## **6-9. WAREHOUSES AND GENERAL STORAGE FACILITIES**

**6-9.1.** A high standard of cleanliness, good housekeeping, and orderly arrangement of stock and other material will be maintained in all parts of the building and area surrounding the building.

**6-9.2.** Combustible packing material shall be stored and handled in the following manner:

(a) Receiving, packing and unpacking of boxed or crated material will be confined to the area designated for that purpose. Open boxes with shredded paper,

excelsior, or other highly combustible packing material will not be permitted beyond these areas.

(b) Noncombustible containers with covers will be used for the collection of all combustible packing material. During unpacking operations, combustible material removed from each box will be properly placed in containers. In no case will an excessive amount of such material be allowed to accumulate on the floor. Discarded combustible waste material, scrap lumber, damaged wooden pallets, empty cartons, soiled rags and containers filled with packing material will be removed from the building to a designated outside storage area as frequently as necessary, or discarded into an outside waste disposal site.

**6-9.3.** Material in stock will be stored in approved bins, on racks, pallets, or skids, which will provide at least 4-inch clearance between the floor and the bottom of the material being stored to protect commodity form possible water damage. Stock of combustible materials should be segregated to the extent practicable and isolated locations will be provided for the following commodity

- (a) Hazardous materials
- (b) Material easily damaged by heat, smoke, or water
- (c) Items having a security classification
- (d) Small items of high monetary value
- (e) Scarce or critical items.

**6-9.4 Stacking and Clearance**

**6-9.4.1.** Material will be stably stacked to reduce the possibility of tipping or collapsing during fire fighting operations.

**6-9.4.2.** A clearance of 24 inches will be maintained from the lowest horizontal level of the roof trusses, radiators, heating pipes, and lighting fixtures.

**6-9.4.3.** A clearance of 18 inches below the horizontal level of each automatic sprinkler head will be maintained. Where hazardous commodities are involved or stacks of regular commodities exceed 15 feet, a clearance of 36 inches will be maintained below the sprinkler head.

**6-9.4.4.** A clearance of 24 inches will be maintained between stored combustibles containers, and substandard interior fire walls. Maintaining a clearance between stored supplies and standard fire walls is not required unless material is subject to expansion when wet.

**6-9.4.5.** A clearance of 30 inches will be maintained between all stored supplies and electrical panels, gas regulators, shutoff valves, fire alarm controls and sprinkler valves.

**6-9.4.6.** Sliding fire doors will never be blocked. A 24 inch clearance will be maintained

around the path of travel of fire doors unless a barricade is provided, in which no clearance will be required. Material will not be stored within 36 inches of the fire door openings. All fire doors will be closed when warehouses are not occupied.

**6-9.4.7.** Permission to block any warehouse exterior door, either cargo or personnel, will be obtained from the Fire Chief. When permission is obtained, a sign must be placed on the outside of the building. The sign will read (**THIS DOOR BLOCKED**). The letters of the sign shall be at least 2 inches in height, and the stroke of the letter shall be no less 1/4 inch. At least one cross aisle and connecting exterior door will be left unobstructed in each bay or section of the warehouse.

**6-9.4.8** All mechanical handling equipment, such as fork-lift trucks, and piling and stacking machines will be an approved type operated by trained personnel and maintained in a safe manner. Gasoline engine driven equipment will be refueled outside of storage buildings. Fork lifts will be placed in designated area along with additional fuel or propane tank. Only one propane container or one 5-gallon safety container of gasoline shall be stored in the designated areas.

**6-9.4.9.** Smoking in warehouses, storage buildings, storage areas and supply sections is prohibited. All receiving, packing and storage areas will be posted with "**NO SMOKING**" signs. Smoking in bodies or trucks or railroad cars, while loading or unloading freight at warehouse door is prohibited.

**6-9.4.9.1.** Commanders or Heads of Activities may designate areas within the warehouse area. Such areas will be plainly marked with signs reading "**SMOKING PERMITTED IN THIS AREA.**"

**6-9.4.9.2.** Smoking materials such as cigars, cigarettes, pipe ashes, and used matches will not be discarded into wastebaskets or onto floors. Approved ash trays of noncombustible material will be used but will not be emptied into wastebaskets or other containers with combustible contents located inside the building. Ashtrays must be able to hold at least 1 and 1/2 packs of cigarettes. Suitable metal cans, properly labeled, will be used for the collection of discarded smoking materials in all buildings or areas where smoking is permitted.

**6-9.5.** The use of electrical appliances for cooking inside the warehouse where commodities and general supplies are stored is prohibited. **Exceptions:** Employee break rooms may be used for cooking providing the area is enclosed by partitions and located away from the main warehouse area. All appliances shall be U/L or F/M approved.

## **6-10. AVIATION FACILITIES**

**6-10.1.** For the purpose of this section, aircraft shall be defined as fixed wing and rotary aircraft.

**6-10.2.** Aircraft being fueled shall be positioned so that aircraft fuel system vents or fuel tank openings are not closer than 25 feet from any terminal building, hangar or service building. Aircraft being fueled shall not be positioned so that the vent or tank openings are within 50 feet of any combustion and ventilation air-intake to any boiler or heater.



**6-10.3.** Access to aircraft by emergency fire equipment shall be established for aviation fuel servicing positions.

**6-10.4.** Prior to making any fueling connection to the aircraft, the fueling equipment shall be bonded to the aircraft by use of cable providing a conductive path to equalize the potential between the fueling equipment and the aircraft. The bond shall be maintained until fueling connections have been removed, thus allowing separated charges that could be generated during the fueling operation to reunite.

**6-10.5.** No flammable or combustible liquid shall be dispensed, transfer, or removed from the fuel system of an aircraft within any aircraft hangar.

**6-10.6.** The use of flammable liquids to clean aircraft parts is prohibited.

**6-10.7.** Smoking and the use of open flame devices is prohibited in any aircraft hangar except in areas adequately separated from the hangar and designated for such use.

**6-10.8.** No aircraft (fixed or rotary wing) shall be stored in any building or facility that is not equipped with a complete automatic fire-extinguishing system.

**6-10.9.** The transfer of fuel from an aircraft to a tank vehicle through a hose generally is similar to fueling, and the same requirements shall apply. In addition, each operator shall establish procedures to prevent the overfilling of the tank vehicle, which is a special hazard when defueling.

**6-10.10.** Aircraft maintenance personnel must notify the fire department and request for a standby during defueling operations. During fueling operations, fire extinguishers shall be available on aircraft ramps or aprons.

**6-10.11.** Portable fire extinguishers shall be placed in a way that the travel distance to any fire extinguisher does not exceed (50) feet from any aircraft. Fire extinguishers shall be kept clear of elements such as ice and snow. Fire extinguishers located in enclosed compartments shall be readily accessible, and their location shall be marked clearly in letters at least (2) inches in height.

**6-10.12.** Each aircraft fuel-servicing tank vehicle shall have two listed fire extinguishers. Each fire extinguisher must have a rating of at least 20-B:C, with one extinguisher mounted on each side of the vehicle.

## **6-11. ELECTRONIC COMPUTER/DATA PROCESSING FACILITIES AND EQUIPMENT**

**6-11.1.** The following risk factors shall be considered when determining the need for additional protection to the environment, function, records, equipment and supplies;

(a) Life safety aspects of the function (e.g., air traffic control, classified sensitive to national security, mission critical to the operation).

- (b) Fire Threat of the installation to occupants or exposed property
- (c) Economic loss from loss of function
- (d) Economic loss from high value equipment (equipment valued over \$75,000).

**6-11.2.** In assessing and evaluating the damage and interruption potential of the loss of computer room operations, attention shall be given to the impact of the loss of data and communication lines. The complexity of the test, research data, and the support function to a particular mission should all be considered in evaluating the need for additional fire-resistive construction and fire protection.

**6-11.3.** Business occupancies that have dedicated computer rooms shall comply with the following construction requirements.

(a) The computer rooms shall not be located above, below, or adjacent to areas or other structures where hazardous processes are located unless adequate fire protection features are provided. The computer rooms shall be separated from other occupancies within the building, including atriums or other open space construction, by fire-resistant rated construction. The construction of walls, and barriers must have a fire resistant rating of no less than (i) hour. Materials used in this fire-resistant construction shall be approved by the fire chief's office.

(b) The fire-resistant rated enclosures shall extend from the structural floor to the structural floor above or to the roof. Cable openings or other penetrations through required fire-rated assemblies shall be stopped with a properly-installed listed fire-stopping material that has a fire-resistance rating equal to the fire-resistance rating of the penetrated barrier.

(c) Abandoned cables shall not be allowed to accumulated. Cables not identified for future use shall be removed.

(d) Interior finishes in the computer areas shall have a Class A rating. Exposed cellular plastics shall not be used in computer area construction, unless the plastic is in a fire-resistant assembly.

(e) All dedicated computer rooms shall be equipped with a raised floor. The raised floor panels and structural supports shall be constructed of noncombustible material. Electric cable openings in floors shall be smooth or shall be otherwise protected to preclude the possibility of damage to the cables. The space beneath the raised floor shall not be used for storage purposes.

(f) Access sections or panels shall be provided in raised floors so that all space beneath the floor is accessible. Tools needed to provide access under the floor space shall be located in the room, and their location shall be clearly marked.

(g) The air ducts shall be provided with automatic fire and smoke dampers where the duct passes through fire-resistant construction.

**6-11.4.** Electronic data-processing equipment that does not qualify to be placed in a dedicated computer room, but is linked to classified or sensitive to national security information, or is mission critical to the operation, shall be placed in an area that has a fire-resistant rating of no less than 1 hour. Materials used in this fire resistant construction shall be approved by the fire chief's office.

**6-11.5.** The amount of records within a computer room shall be kept to the absolute minimum. Only records that are essential to the computer operations shall be permitted to be kept in the computer room.

**6-11.6.** Tape libraries and record storage rooms within the computer area shall be protected by an extinguishing system and separated from the computer room and other portions of the computer area by fire-resistant-rated construction. The fire resistance rating shall be commensurate with the exposure but not less than 1 hour.

**6-11.7.** The records storage room shall be used only for the storage of records. All other operations, including splicing, repairing, erasing, reproducing, cataloging, and so forth shall be prohibited in this room or area.

**6-11.8.** Paper stock, inks, unused recording media, and other combustibles within the computer room shall be restricted to the absolute minimum necessary for efficient operation. Any such materials in the computer room shall be kept in totally enclosed metal file cabinets or, if provided for in individual machine design, shall be limited to the quantity prescribed and located in the area designated by the equipment manufacturer.

**6-11.9.** Reserve stocks of paper, inks, unused recording media, and other combustibles shall be stored outside of the computer room.

**6-11.10.** An extremely high standard of cleanliness must be maintained in computer rooms including the area under the raised floor. Such areas must be inspected at least monthly and cleaning be accomplished to prevent any noticeable accumulation of dust and dirt since dust and dirt can cause false alarm of the smoke detection system installed in the raised floor or ceiling.

**6-11.11.** Smoking and eating in computers rooms is prohibited.

**6-11.12.** Noncombustible covered trash cans shall be provided in all computer rooms. Trash containers shall not be left uncovered and shall be emptied at least daily.

**6-11.13.** Every computer room shall be designed with a power disconnect to all electronic equipment. There shall be a similar means to disconnect the power to all HVAC systems serving the room, and it shall cause all required fire/smoke dampers to close. The control for these disconnecting means shall be grouped and identified and shall be readily accessible at the principle exit doors. A single disconnect can be used to shut off both the electronic equipment and the HVAC equipment.

**6-11.14.** Buildings that have computer rooms or electronic equipment valued over \$75,000.00, or the electronic equipment is vital to the mission shall be protected by an

automatic smoke detection system. An automatic smoke detection system shall be installed in the following locations.

- (a) At the ceiling level throughout the computer area.
- (b) Below the raised floor of the computer area containing cables.
- (c) Above the suspended ceiling and below the raised floor in the computer area where these spaces are used to recirculate air to other parts of the building.

**6-11.15.** Where interlock and shutdown devices are provided, the electrical power to the interlocks and shutdown devices shall be supervised by the fire system.

**6-11.16.** The alarm and trouble signals of the automatic detection system shall be arranged to send an electronic signal to the local fire station. Where smoke detection is part of a extinguishing system, smoke detectors shall be crossed zoned to prevent pre-activation of the extinguishing system.

**6-11.17.** Where there is a critical need to protect data in process, reduce equipment damage, facilitate return to service, or where critical equipment is being used, consideration must be given to the use of a safe gaseous-agent system inside the computer room. All other areas shall be protected by an approved automatic sprinkler system. Where a total safe gaseous flooding system is used, the system shall be designed to provide manual activation of the system. Computer rooms that are protected by a fixed fire suppression system will not be enlarged, reduced in size or otherwise modified without the approval of the fire department.

**6-11.18.** All automatic extinguishing system shall be designed with an abort button located near the exit doors.

**6-11.19.** Portable fire extinguishers with a rating for electrical and combustible fires shall be installed in all computer rooms and areas where critical electronic equipment are being used.

## **6-12. ATTENDED OR UNATTENDED SELF-SERVICE FUEL STATIONS**

**6-12.1.** Every fuel-dispensing station shall be provided with a master electrical shutoff switch at the main electrical panel and an emergency shutoff switch located on the exterior wall of the gas station. The emergency shutoff switch shall be within 100 feet of any fuel pump at attended fuel stations and not more than 20 feet for unattended fuel stations. Attended fuel stations shall have at least one attendant on duty while the station is open for business. There shall be an additional emergency shutoff switch at the attendant's station. The emergency shutoff switch shall be accessible to users of the service station at all times and shall be labeled "**EMERGENCY SHUT OFF**" in letters one and one-half inches high with one inch stroke. The letters shall be red on a white background.

**6-12.2.** At unattended fuel stations, operating instructions shall be conspicuously posted in the dispensing area and shall include the location of emergency controls. Further instructions shall be displayed, stating that the vehicle operator or the pump user shall stay outside of his/her vehicle in view of the fueling nozzle during dispensing.

**6-12.3.** In addition to those warning signs specified in paragraph 6-12.1 and 6-12.2, emergency instruction shall be conspicuously posted in the dispensing area as follows: **“IN CASE OF FIRE OR SPILL: 1. USE THE EMERGENCY STOP BUTTON. 2. REPORT THE ACCIDENT BY CALLING (911).”**

**6-12.4.** A telephone shall be readily available at all fuel-dispensing stations in order to report an incident.

**6-12.5.** Every fuel pump shall be labeled **“NO SMOKING, TURN ENGINE OFF”** on every side displaying the meter.

**6-12.6.** Fuel-dispensing pumps shall not be located inside any building.

**6-12.7.** Fuel-dispensing pumps or dispensing devices, except those attached to containers, shall either be mounted on a concrete island or otherwise protected against collision damage by suitable means and shall be securely bolted in place.

**6-12.8.** At unattended fuel stations, a listed, automatic-closing type nozzle valve with open-latch device shall be provided. The system shall include listed equipment with a feature that causes or requires the closing of the nozzle valve before the product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

**6-12.9.** A listed emergency breakaway device designed to retain liquid on both sides of the breakaway point shall be installed on each hose dispensing Class I liquids. The devices shall be installed and maintained in accordance with the manufacturer's instructions. Where hoses are attached to a hose-retrieving mechanism, the listed emergency breakaway device shall be installed between the point of attachment of the hose-retrieving mechanism to the hose and the hose-nozzle valve.

**6-12.10.** Dispensing devices used to fill portable containers of home heating fuels shall be located at least 20 feet from any dispensing devices for Class I liquids. Dispensing devices used for Liquidified Petroleum Gas (LPG), Liquidified Natural Gas (LNG), and Compressed Natural Gas (CNG) shall also be located at least (20) feet from any dispensing device for Class I liquids.

**6-12.11.** It is unlawful and dangerous to dispense gasoline into unapproved containers such as a glass container, or an open-topped container by a service attendant or customer. Only containers that are constructed of metal or plastic, have a tight closure, and are fitted with a spout or are so designed that the contents can be dispensed without spilling are authorized for use.

### **6-13. VEHICLE MAINTENANCE FACILITIES**

**6-13.1.** A high standard of cleanliness, good housekeeping, and orderly arrangement of stock, vehicles, and other material will be maintained in all parts of the building and area surrounding the building.

**6-13.2.** Dispensing of flammable and combustible liquids within a building shall be limited to rooms or areas approved for such operation. Dispensing shall be from:

- a. The original shipping containers of five gallons or less capacity, or
- b. Approved safety cans, or
- c. Through a closed piping system, or
- d. A container by means of a device drawing through an opening in the top of the container, or
- e. A drum by gravity through a listed self-closing valve or faucet.

**6-13.3.** Electrical bonding of all flammable-liquid containers involved in the transfer operation shall be accomplished prior to the beginning of any transfer and shall remain in place until the transfer is complete.

**6-13.4.** Drip pans shall be provided at each dispensing area and shall be placed under each container.

**6-13.5.** Flammable and combustible liquids shall not be dispensed by a device that operates through pressure within a storage tank or container, unless the tank or container has been approved as a pressure vessel for the use.

**6-13.6.** Teaching maintenance shop fuel systems may be modified to create a close to field condition as possible without the use of an installed vehicle gas tank. Where safety cans are used as a fuel tank the safety can may be modified as follows:

a. Two tubes of either copper or steel will be welded securely into each can, one on each side of the handle. One tube will extend to within one inch of the bottom of the can, and the second tube (vent return) will extend approximately one inch into the can. The holes drilled for these tubes shall be as small as practicable for the tubing used. The tubing shall not extend more than three inches above the top of the container.

b. The method of attachment of the lines to the tubing is optional, but must be adequately secured; and lines must be approved for such use with the fuel involved.

c. In all cases, the flash screen must remain in place, and no other openings in the container are permitted.

**6-13.7.** Provision shall be made to prevent flammable or combustible liquids which may be spilled at loading or unloading points from entering public sewer and drainage systems or natural waterways. Connections to such sewers, drains or waterways by which flammable or combustible liquids might enter shall be provided with separator boxes or other approved means whereby such entry is precluded. Crankcase draining and flammable or combustible liquids shall not be dumped into sewers but shall be stored in tanks or tight drums outside of any buildings until removed from the premises.

**6-13.8.** Used tires or tires for disposal shall not be stored in the building. Tire storage area outside of the building shall be placed at least 25 feet from the building. The accumulation of used tires shall not exceed 100 tires.

**EXCEPTION:** If repair garages cannot place tires at least 25 feet away from the building, the tires may be placed closer providing the wall of the building is constructed of noncombustible material, and there are no openings on the wall where the tires are being stored. Tires must be kept at least 10 feet from the noncombustible walls.

**6-13.9** Oily rags shall be placed in a noncombustible container with a self-closing lid. The Container must be marked "**OILY RAGS ONLY.**" Storage of clean rags shall be stored in a non-combustible container equipped with a lid.

## Chapter 7

### Special Processes

#### 7.1. COMPRESSED GASES

**7-1.1.** The storage, handling and use of compressed gases shall conform to the requirements of regulations, national fire codes and standards, the Department of Transportation as well as any applicable provisions referenced herein.

**7-1.2.** Containers shall only be used to contain the materials for which they are designed. Compressed gas containers, cylinders or tanks that are not designed for refillable use shall not be refilled after the use of the original contents. The use of containers for materials requiring a container of a different specification is prohibited.

#### 7-1.3. MARKING

**7-1.3.1.** All containers shall be plainly marked with the name of the gas contained therein or with the percentage of each gas if the contents are a mixture.

**7-1.3.2.** Stationary compressed gas containers, cylinders and tanks shall be marked in accordance with the latest edition of NFPA 704. Markings shall be visible from any direction of approach.

**7-1.3.3.** Markings used for piping systems shall consist of the content's name and include a direction of flow arrow. Markings shall be provided at each valve; at wall, floor or ceiling penetrations; at each change of direction; and at a minimum of every 20 feet or a fraction thereof throughout the piping run.

**Exception:** Piping that is designed or intended to carry more than one gas at various times shall have appropriate signs or markings posted at the manifold, along the piping and at each point of use to provide clear identification and warning.

#### 7-1.4. PROTECTION

**7-1.4.1.** Compressed gas containers, cylinders, tanks and systems shall be secured against accidental dislodgement and against access by unauthorized personnel.

**7-1.4.2.** Compressed gas containers, cylinders, tanks and systems which could be exposed to physical damage shall be protected. Guard posts or other means shall be provided to protect compressed gas containers, cylinders, tanks and systems indoors and outdoors from vehicle damage.

**7-1.4.3.** Compressed gas containers, cylinders, and tanks shall be secured to prevent falling due to contact, vibration or seismic activity. Securing of compressed gas containers, cylinders and tanks shall be by one of the following:

- a. Securing the containers, cylinders and tanks to a fixed object with one or more restraints.



b. Securing the containers, cylinders and tanks on a cart or other mobile device designed for the movement of the compressed gas containers, cylinders and tanks.

c. Nesting of compressed gas containers, cylinders, and tanks at container filling or servicing facilities or in warehouse not accessible to the general public. Nesting shall be allowed provided the nested containers, cylinders or tanks, if dislodged, do not obstruct the means of egress.

d. Securing of compressed gas containers, cylinders and tanks to or within a rack, framework, cabinet or similar assembly designed for such use.

**7-1.4.4.** Compressed gas container, cylinder and tank valves shall be protected from physical damage by means of protective caps, collar or similar devices. Compressed gas containers, cylinders and tanks designed for protective caps, collars or other protective devices shall have the caps or devices in place except when the containers, cylinders or tanks are in use or are being serviced or filled.

**7-1.4.5.** Compressed gas containers, cylinders and tanks, except those designed for use in a horizontal position, and all compressed gas containers, cylinders and tanks containing non liquidified gases shall be used in an upright position with the valve end up. An upright position shall include conditions where the container, cylinder or tank axis is inclined as much as 45 degrees from vertical.

**7-1.4.6.** Containers, cylinders and tanks shall be moved using an approved method. Where containers, cylinders or tanks are moved by hand cart, hand truck or other mobile device, such carts, trucks or devices shall be designed for the secure between containers of containers, cylinders or tanks. Carts and trucks utilized for transport of compressed gas containers, cylinders or tanks exterior to buildings shall be designed so that the containers, cylinders and tanks will be secured against dropping or otherwise striking against each other or other surfaces.

**7-1.4.7.** Lifting devices such as ropes, chains or slings shall not be used to suspend compressed gas containers, cylinders and tanks unless provisions at time of manufacture have been made on the container, cylinder or tank for appropriate lifting attachments, such as lugs.

**7-1.4.8.** Transfer of gases between containers, cylinders and tanks shall be performed by qualified personnel using equipment and approved operating procedures.

**7-1.4.9.** Inflatable equipment, devices or balloons shall only be pressurized or filled with compressed air or inert gases. Temporary storage of compressed gas cylinders for use at carnivals or exhibits shall be adequately secured to a stationary object.

**7-1.4.10.** Storage of compressed gas containers, cylinders and tanks are prohibited in rooms where they are being used. The maximum allowable in any laboratory or use area is one cylinder, container and tank of each gas being used or one day's supply, whichever is greater. Containers, cylinders and tanks that will not be used for a period in excess of one week shall be removed to an outside storage area.

**7-1.4.11.** Compressed gas containers, cylinders and tanks shall be separated from each other based on the hazard of their contents.

**7-1.4.12.** Combustible waste, vegetation and similar materials shall be kept a minimum of 20 feet from compressed gas containers, cylinders, tanks and systems. A noncombustible partition, without openings or penetrations and extending not less than 18 inches above and to the sides of the storage area, is allowed in lieu of such distance. The wall shall either be an independent structure, or the exterior wall of the building adjacent to the storage area.

**7-1.4.13.** Compressed gas containers, cylinders, tanks and systems shall not be exposed to corrosive chemicals or fumes which could damage containers, cylinders, valves or valve-protective caps.

**7-1.4.14.** Electrical wiring and equipment around the storage of compressed gas containers, cylinders, tanks and systems shall comply with the latest edition of NFPA 70, Article 500 for hazardous locations.

**7-1.4.15.** Service, repair, modification or removal of valves, pressure-relief devices or other compressed gas container, cylinder or tank appurtenances shall be performed by trained personnel.

**7-1.4.16.** Compressed gas containers, cylinders, tanks and systems shall not be used for any purpose other than to serve as a vessel for containing the product which it is designed to contain.

**7-1.4.17.** Compressed gas containers, cylinder or tanks which have been exposed to fire shall be removed from service.

**7-1.4.18.** Leaking, damaged or corroded compressed gas container, cylinders and tanks shall be removed from service. Leaking, damaged or corroded compressed gas systems shall be removed, replaced or repaired in accordance with the following.

a. Compressed gas systems which are determined to be leaking, damaged or corroded shall be repaired to a serviceable condition or removed from service.

b. Compressed gas containers, cylinders and tanks which have been removed from service shall be handled in an approved manner.

**7-1.4.19.** Buildings requiring storage space for compressed gas cylinders shall have separate exterior storage facilities constructed at least 50 feet from the building. Storage facilities for oxygen shall be separated from storage facilities for fuel gases by at least 25 feet.

## **7-2. CRYOGENIC FLUIDS**

**7-2.1.** The storage, handling, and use of cryogenic fluids shall conform to the requirements of regulations, national codes and standards referenced herein as well as the requirements of this regulation.

**7-2.2.** Partially-full containers having residual cryogenic fluids shall be considered as full for the purpose of the controls required.

### **7-2.3. PRESSURE-RELIEF DEVICES**

**7-2.3.1.** Containers shall be provided with pressure-relief devices.

**7-2.3.2.** Heat exchangers, vaporizers, insulation casing surrounding containers, vessels and coaxial piping systems in which liquefied cryogenic fluids could be trapped due to leakage from the primary container shall be provided with a pressure-relief device.

**7-2.3.3.** Pressure relief devices shall be sized in accordance with the specifications to which the container was fabricated. The relief device shall have sufficient capacity to prevent the maximum design pressure of the container or system from being exceeded.

**7-2.3.4.** Pressure-relief devices shall be located such that they are provided with ready access for inspection and repair.

**7-2.3.5.** Pressure-relief devices shall be arranged to discharge unobstructed to the open air in such a manner as to prevent impingement of escaping gas on personnel, containers, equipment and adjacent structures or to enter enclosed spaces. Pressure-relief device vent lines shall be installed in such a manner to exclude or remove moisture and condensation and prevent malfunction of the pressure-relief device due to freezing or ice accumulation.

### **7-2.4. MARKING**

**7-2.4.1.** Visible hazard identification signs shall be provided at entrances to buildings or areas in which cryogenic fluids are being stored, used or handled. Rooms or areas containing cryogenic containers shall be labeled at all entrances. The sign must read: **"THIS ROOM/AREA CONTAINS CRYOGENIC MATERIAL."** Letters shall be at least one and one-half inches in height, and the stroke of the letter shall be at least one-quarter inch.

**7-2.4.2.** Stationary above-ground containers shall be placarded and contents shall be identified. Stationary containers shall be identified with the manufacturing specification and maximum allowable working pressure with a permanent nameplate. The nameplate shall be installed on the container in an accessible location.

**7-2.4.3.** Container inlet and outlet connections, liquid-level limit controls, valves and pressure gauges shall be identified in accordance with one of the following: marked with a permanent tag or label identifying their function, or identified by a schematic drawing which portrays their functions and designates whether they are connected to the vapor or liquid space of the container. When a schematic drawing is provided, it shall be attached to the container and maintained in legible condition.

**7-2.4.4** Emergency shut off valves shall be identified, and the location shall be clearly visible and indicated by means of a visible sign.

**7-2.5.** Cryogenic containers of substances which are flammable at normal room temperature will be kept in well-ventilated places at all times. Such containers shall not be kept in a laboratory storage area or room that is not well ventilated.

### **7-3. WELDING AND OTHER HOT WORK**

**7-3.1.** All welding and cutting operations shall comply with the provisions of this regulation and applicable codes and standards referenced herein.

**7-3.2.** Prior to performing electric and gas welding or cutting operations requiring an open flame device in any building, other than shops or areas established and approved for such purposes, the individual must obtain a written flame permit issued by the fire department. A permit for hot work operations shall not be issued unless the individual in charge of performing such operation is capable of performing such operations safely. To request a flame permit, contact the fire department 24 hours in advance when possible.

**7-3.3.** The permit holder shall maintain a record of all locations where hot work operations are performed and shall have the record available for inspection by the fire department. Flame permits will only be issued for 30 days, and each hot work operation that is connected to the original hot work must have a flame permit. Days left on a 30-day flame permit may not be transferred to another hot work location.

**7-3.4.** Hot work shall not be performed on containers or equipment that contain flammable liquids, gases or solids until the containers and equipment have been thoroughly cleaned, purged, and rendered inert.

**7-3.5.** Hot work shall not be performed on a vehicle that is capable of firing explosive material until the vehicle has received a certificate rendering it safe and free of explosive residue. A flame permit issued on a vehicle is required to have dual signage between the fire department and the appropriate safety office.

**7-3.6.** A pre-hot work check shall be conducted prior to work to ensure that all equipment is safe and hazards are recognized and protected. A pre-hot check shall include but is not limited to the following:

- a. Cutting, grinding and welding equipment to be used shall be in satisfactory operating condition and in good repair.
- b. Hot work site is clear of combustibles, or the combustibles are protected.
- c. If exposed construction membrane is combustible, it must be protected.
- d. Openings vertical and horizontal are protected.
- e. Floors are kept clean.
- f. No exposed combustibles are located on opposite side of partition, walls, ceilings, or floors.

g. Fire extinguishers will be provided by the requester in operable condition and available at the perspective hot work site.

h. Permissible actions have been taken to prevent accidental activation of fire detection and suppression equipment.

i. Fire watch is required during the hot operation and 30 minutes after the hot work has stopped for the day.

j. A final inspection must be made before leaving the site each day.

**7-3.7.** Cylinders, valves, regulators, hose and the apparatus and fittings for oxygen shall be kept free from oil or grease. Oxygen cylinders, apparatus and fittings shall not be handled with oily hands, oily gloves, or greasy tools or equipment.

**7-3.8** Cylinders will not be transported without protective caps in place to protect valves. Where cylinders are used as part of a mobile welding shop, suitable frames may be constructed to hold cylinders securely in place and protect valves from damage in case of accident involving the vehicle.

#### **7-4. SPRAY FINISHES AND PAINT BOOTHS**

**7-4.1.** All spray painting and other methods of application of flammable finishes shall conform to this regulation and applicable codes and standards referenced herein.

**7-4.2.** Smoking shall be prohibited in the vicinity of any operation involving the application of flammable finishes. Adequate "NO SMOKING" signs will be conspicuously posted.

**7-4.3.** Spray finish operations conducted in buildings used for assembly, educational, institutional or residential occupancies shall be located in a spray room protected with an approved automatic sprinkler system and separated vertically and horizontally from other parts of the building. Spray finishes operations shall be conducted in a spray room, spray booth, spraying space or limited spraying space approved for such use.

**7-4.4.** All sprinkler heads exposed to paint or other finish residue in spray booths shall be covered by a single, clear plastic bag (sandwich bag) held in place in a secure manner so as to prevent any accumulation of residue on the head, which could cause the sprinkler head to fail in the event of a fire. Bags shall be replaced when the sprinkler head is visually obscured. Sprinkler heads that have been painted must be replaced.

**7-4.5.** The interior surfaces of spray rooms shall be smooth and continuous, without edges, and shall be constructed to permit the free passage of exhaust air from all parts of the interior and to washing and cleaning. Spray rooms shall be so designed to confine residues within the room. Spraying test patterns on the walls of a paint booth is strictly prohibited. Excessive paint residue that is attached to the walls of the paint booth will cause condemnation of the paint booth until the walls have been cleaned or resurfaced.

**7-4.6.** Combustible floor construction in spray booths and spray rooms shall be covered with an approved noncombustible non-sparking material.

**Exception:** where combustible coverings, such as thin paper or plastic and strippable coatings are utilized over noncombustible materials to facilitate cleaning operations in spray booth and spray rooms.

**7-4.7.** Spray booths shall be installed so that all parts are readily accessible for cleaning. A clear space of not less than 3 feet shall be maintained on all sides of the spray booth. This clear space shall be kept free of any storage or combustible construction.

**7-4.8.** Positive mechanical ventilation shall be installed which provides a minimum of six complete air changes per hour. Each spraying area shall be provided with mechanical ventilation that is capable of confining and removing vapors and mists to a safe location and is capable of confining and controlling combustible residue dust and deposits. The concentration of the vapors and mists in the exhaust stream of the ventilation system shall not exceed 25 percent of the lower explosive limit (LEL).

**7-4.9.** Filters shall be inspected to ensure that there is no excessive accumulation of paint residue that would reduce the required air flow. Discarded filters shall be immediately removed to a safe, detached location or placed in a noncombustible container with a tight-fitting lid and disposed of properly.

## **7-5. ASPHALT KETTLES**

**7-5.1.** All asphalt (tar) kettles using fire or flame to heat the product are required to have a written flame permit from the fire department.

**7-5.2.** An asphalt (tar) kettle, beneath which is maintained an open fire, heated coals or ashes, shall not be transported or permitted to be transported while heating is in progress.

**7-5.3.** Asphalt kettles will not be closer than 25 feet from any building, vehicle, structure or combustible material unless permitted by the fire department.

**7-5.4.** Asphalt kettles using fire or flame will not be used inside of or on the roof of any building.

**7-5.5.** All weeds, grass, vines and other growth, that endangers property or is capable of being ignited, shall be cut down before setting the kettle into operation.

**7-5.6.** An operating kettle shall be attended by a minimum of one employee knowledgeable of the operations and hazards. The employee shall be within 100 feet of the kettle and have the kettle within unobstructed sight.

**7-5.7.** Two approved fire extinguishers having a rating of 20-B:C (10 pounds) shall be provided by the owner of the kettle and maintained within 25 feet of the operating kettle and of the roof of the building. One of the fire extinguisher can be a 15-pound CO<sub>2</sub> fire extinguisher.

**7-5.8.** Kettles operated by Liquidfied Petroleum Gas (LPG ) gas shall store spare LPG cylinders at least 25 feet away from an operating kettle. The LPG containers for roofing kettles shall not be used on or in any building. The protective cap shall be placed on all spare cylinders to protect the valves. All LPG cylinders shall be secured to a permanent fixture or grouped together to prevent the cylinders from falling and damaging the valves.

**7-5.9.** Asphalt kettles will not be closer than 100 feet from any explosive/ammunition location/ facility unless authorized by the fire department and the appropriate safety office responsible for the facility.

## **7-6. AUTOMOBILE, AIRCRAFT, TRACK VEHICLE WRECKING OPERATION, JUNK METAL AND WASTE METAL MATERIAL HANDLING OPERATIONS**

**7-6.1.** Wrecking, scrap metal, junk or waste material handling operations shall comply with all other applicable requirements of this regulation as well as the following provisions.

**7-6.2.** Before cutting into any vehicle, aircraft or track vehicle regardless if cutting is conducted by torch or saw, a written flame permit must be obtain from the fire department. If the vehicle, aircraft or track vehicle was equipped with military armament, a render safe certificate must be provided before a flame permit can be obtained as described in paragraphs 7-3.4 through 7-3.8.

**7-6.3.** The burning of wrecked or discarded motor vehicles, junk, or any waste or salvaged material for disposal is strictly prohibited.

**7-6.4.** Junk, waste and salvaged material shall be stored, placed and kept in such a manner as to provide adequate access for firefighting at all times as determined by the fire chief's office.

## **7-7. FIREWORKS**

**7-7.1.** The possession, sale, distribution, and use of fireworks on the installation is prohibited except for licensed commercial displays.

**7-7.2.** Contractors for commercial displays of fireworks shall be licensed by the Maryland State Fire Marshal's Office or be a certified explosive operator. The copy of the license or certificate must be provided to the fire chief's office in order to obtain a written permit from the fire department.

**7-7.3.** All displays of fireworks are required to have a written flame permit from the fire department. A representative of the fire chief's office shall be on site of any fireworks' display in order to determine compliance with all safety and fire regulations.

**7-7.4.** The vehicle transporting fireworks shall be parked in an isolated area when not setting up displays. A guard must be provided at the site where the vehicle is parked while the vehicle has explosives on board.

**7-7.5.** The organization requesting a fireworks' display must contact the fire department before a contract can be written. A pre-inspection of the proposed fireworks' site must be accomplished.

**7-7.6.** The fire department is authorized to revoke a certificate and discontinue the fireworks' display for failure to comply with the requirements of this chapter.

**7-7.7.** The permit holder shall furnish bond or certificate of insurance in the amount deemed adequate by local officials for the payment of all potential damages to a person or persons or to property by reason of the permitted display, and rising from any acts of the permit holder, his agents, employees or subcontractors.

## **7-8. EXPLOSIVE/AMMUNITION HANDLING AND STORAGE**

**7-8.1.** Anytime explosive materials are brought into any area or building not normally containing explosives, the fire department will be notified in advance of the quantity, explosive class and division, intended use and dangers involved.

**7-8.2.** Matches or other flame or spark-producing devices will not be permitted in any magazine area or explosive areas unless the commanding officer or his or her designated representative provides written authority.

**7-8.3.** All flash lights or storage-battery lamps used in buildings containing hazardous quantities of exposed explosives or flammable vapors will be certified for use in an hazardous environment.

**7-8.4.** Smoking is prohibited in any explosive storage or operating area or location, except as permitted as follows:

**7-8.4.1.** Smoking may be allowed within an explosives area or location that is specially designated and posted "AUTHORIZED SMOKING AREAS." A certification of approval by the installation commander or his or her designated representative (Fire Chief or Fire Marshal), in coordination with the safety office, will be displayed in each designated smoking area.

**7-8.4.2.** The designated smoking area shall be equipped with noncombustible ashtrays capable of holding a minimum of two packs of cigarettes.

**7-8.4.3.** If electric power is available in the designated smoking area, push button electric lighters that cut off when pressure is released will be used. Lighters will be permanently installed to prevent removal and use outside the designated area.

**7-8.4.4.** Where intervening noncombustible walls are not available to separate a potential smoking area from an area where ammunition and explosives are present, the smoking area shall be separated by a distance of at least 50 feet from the ammunition or explosives.

**7-8.4.5.** A portable fire extinguisher shall be installed in every designated smoking area. The fire department must be notified for installation, size, and type of extinguisher.



**7-8.4.6.** Personnel whose clothing is contaminated with explosive residue or other hazardous materials will not be allowed in the smoking area.

**7-8.4.7.** A “**NO SMOKING**” sign will be posted at each entrance to an explosive storage area. Where applicable, include a notice that flame-producing devices must be turned over to the entry controller or placed in a container outside of the explosive area.

**7-8.4.8.** Smoking is prohibited in, on, or within 50 feet of any motor vehicle, trailer, aircraft, rail car, or material handling equipment loaded with explosive items.

**7-8.5.** Heat-producing devices which produce temperatures higher than 228°F degrees in any explosive area should be confined to essential, temporary use. A written flame permit is required by fire and safety approval for those heat-producing devices before beginning work. They should cover the location, purpose, duration, and details of general and explosives' safety precaution to be used. Approved furnaces, electrical space heaters, and electrical

**7-8.6.** All wax pots regardless of size will be equipped with a power indicator light, lids with fusible links, and placed on noncombustible surfaces. Wax pot with a capacity of more than one gallon must be equipped with dual temperature controls.

**7-8.7.** A fire break of at least 50 feet will be maintained around each above-ground magazine, operating building or location, outdoor storage site, and explosive facility. A fire break of at least 10 feet will be maintained around earth-covered magazine ventilators.

**7-8.8.** Magazine floors and floors in operating buildings shall be regularly swept and kept clean, dry and free of grit, paper, empty packages and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from magazine floors and from operating buildings shall be disposed of in accordance with organizational Standard Operating Procedures (SOP).

**7-8.9.** All explosive materials shall be removed from the magazine before making repairs to the interior of a magazine. All explosives shall be removed from the magazine before making repairs to the exterior of magazines where there is a possibility of causing a fire. Explosive materials removed from a magazine under repair shall either be placed in another magazine or placed a safe distance away from the magazine, where they shall be properly guarded and protected until repairs have been completed. Upon completion of repairs, the explosive materials shall be promptly returned to the magazine. Floors shall be cleaned before and after all repairs.

**7-8.10.** Explosive assembly facilities and loading rooms that do not have natural lighting shall be provided with emergency lighting. Windowless structures and loading rooms that are equipped with emergency generated power are exempt. The installation of emergency lighting shall comply with the latest edition of NFPA 70 (National Electrical Code), Article 500 for hazardous location. All electrical appliances used in an explosive environment shall be U/L approved and listed for use in a Class I, Division 1, hazardous location.

**7-8.11.** Combustible materials, such as wood, paper, wooden pallets, wooden ammunition boxes and rags in support of the operation must be stored a safe distance away from explosives. In facilities that are equipped with bays or cells, combustible material will be stored in a separate cell from the explosives. The storage of lumber and other bulk combustible materials will be stacked in an orderly manner outside of an explosive facility.

**7-8.12.** A limited supply of paint and flammable aerosols, not to exceed a one day requirement, may be stored in explosives operating facilities. All paints and flammable aerosol will be stored in an approved flammable liquid cabinet.

**7-8.13.** All woodworking equipment that is capable of producing wood chips, sawdust and fine wood dust shall be equipped with a complete dust collection system. The dust collection system shall be installed in accordance with the latest edition of NFPA 664 and paragraphs 6-8.1 through 6-8.11 of this regulation.

**7-8.14.** Fire symbols shall be posted on the street side of the building. If the approach to the building can be reached two separate ways, then additional fire symbols must be installed on each street approach side. Fire symbols signs shall be installed at a distance of six feet from the ground level and be able to be seen at a distance of 1,000 feet. Vegetation along road side must be trimmed back to allow a clear line of sight to the approach of the building. For magazines that are in a compound and are storing the same explosives in each of the magazines, only one fire symbol is required and must be posted at the principal entrances to the compound.

**7-8.15.** Buildings containing arms' rooms shall have the appropriate fire symbol posted on the outside of the building. Entrance to the arms' room shall have a fire symbol posted on the door. The fire symbol posted inside buildings shall of a minimum of 10 inches in height. The buildings that are equipped with different multi-cubical bays or module cells and have different explosives stored in the cells, each cell must be equipped with a fire symbol.

**7-8.16.** The fire symbols signs shall be a minimum of 24 inches in width and height. The length of the number shall be a minimum of ten inches and the stroke of the number shall be a minimum of 1 inch. Fire and chemical hazard symbols that are fading must be replaced to provide maximum visibility.

**7-8.17.** When explosives contain material that is violently reactive to water, a sign must be installed on the outside of the building stating "APPLY NO WATER." Explosive containing hazardous or toxic compounds shall have the appropriate chemical symbols posted on the outside of the building.

**7-8.18.** Fire symbols will be removed, covered or reversed if the explosive or chemical agent has been removed from the facility or location. The person in charge of the operation will post or change the symbols. The fire department will be notified each time fire or hazard symbols are changed.

**7-8.19.** The person in charge of the operation will assure that the building assignment record (EAP Form 1076) is placed on the front entrance of each magazine and operating explosive facility. It is the responsibility of the person in charge to update the information of

the primary and alternate custodians. As outlined in paragraph 1-6.9.2, the person in charge must fill out the appropriate information to be placed on the door. The only telephone number that will be placed on the card is the duty telephone number. All other telephone numbers will be placed on another EAP Form 1076, giving non-duty telephone numbers and addresses. The completed EAP Form 1076 will be sent to the appropriate fire stations (AA) building 2200, (EA) building E-5180. It is the responsibility of the person in charge to keep this information current

**7-8.20.** Vehicles transporting explosives shall comply with the following:

**7-8.20.1** Vehicles regularly used for transporting ammunition, explosives, or chemical munitions will have permanent brackets mounted on the front and rear of the vehicle, usually on the front bumper and the rear tailgate. These brackets will be equipped with a device to prevent the symbol from falling from the bracket in any position the vehicle may be in, including upside down. Vehicles carrying chemical munitions will have an additional set of brackets mounted beside the fire symbol front and rear, with the appropriate chemical warning signs.

**7-8.20.2** No vehicle transporting explosive materials shall be parked before reaching its destination, even while attended, on any public street adjacent to or in close proximity to any bridge, tunnel, dwelling, or place where people work, congregate or assemble.

**7-8.20.3.** Vehicles used for transporting explosive materials shall have no exposed spark-producing surface on the inside of the body. The floors of the transportation vehicle shall be tight.

**7-8.20.4.** There shall be two ABC rated portable fire extinguishers mounted on all vehicles transporting explosives. The fire extinguishers shall be mounted on each side of the vehicle and shall be located where they are accessible for immediate use.

**7-8.20.5.** Motor vehicle operators transporting explosives shall conduct a daily inspection of the following:

- a. Fire extinguishers are fully charged.
- b. Exhaust system is not exposed to accumulation of grease, oil, gasoline, or other fuels and has ample clearance from fuel lines and other combustible materials.
- c. All electrical wiring is sealed and completely protected and securely fastened to prevent short-circuiting.
- d. Tires are inflated properly and free of defects.

**7-8.21.** Simulated explosives shall be handled and stored in the same manner as regular explosives. Simulated explosives may only be stored in a licensed facility, building or magazine.

## **7-9. LABORATORIES**

**7-9.1** All laboratory facilities or laboratory rooms shall comply with all other applicable requirements of this regulation as well as the following provisions.

**7-9.2.** A second means of access to an exit shall be provided from a laboratory work area if any of the following situations exist.

- a. A laboratory work area contains an explosion hazard so located that an incident would block escape from or access to the laboratory work area.

- b. A laboratory work area within a Class A laboratory unit exceeds 500 square feet.

- c. A laboratory work area within a Class B through D laboratory unit exceeds 1,000 square feet.

- d. A hood in a laboratory work area is located adjacent to the primary means of egress.

- e. There is a compressed gas cylinder in use that contains a gas that is flammable or has a health hazard rating of 3 or 4, and could prevent safe passage in the event of accidental release of cylinder contents.

**7-9.3.** Compressed gas cylinders having a health hazard ratings of 3 or 4, and cylinder gases having health hazard rating of 2 with no physiological warning properties shall be kept in a continuously mechanically ventilated hood or other continuously mechanically ventilated enclosure.

**7-9.4.** Compressed gas cylinders stored in a laboratory shall be kept to an absolute minimum and will comply with the following:

- a. Cylinders shall be secured from tipping over by holders designed for such use.

- b. Cylinders in the laboratory shall be equipped with a pressure regulator designed and marked for its maximum use.

- c. Cylinders shall have a manual shutoff valve. A quick connect shall not be used in place of a shutoff valve. Line regulators that have their source away from the point of use shall have a manual shutoff valve near the point of use.

**7-9.5.** Cylinders that are not required for current laboratory requirements or testing, shall be removed and stored in a safe location outside the laboratory work area.

**7-9.6.** Emergency lighting shall be provided in all laboratories that are 500 square feet or greater.

**7-9.7.** Furniture, cabinets, and equipment in laboratory work areas shall be arranged so that there is a clear passage to an exit from any point in the room.

**7-9.8.** Laboratory heating equipment such as ovens, burners, furnaces, environmental chambers, and other heated enclosures shall not be used to heat, store, or test flammable or combustible liquid aerosols containing gases unless the equipment is designed or modified to prevent internal explosion. Burners and induction heaters shall be located a safe distance from areas where temperature-sensitive and flammable materials and compressed gases are handled.

**7-9.9.** Each refrigerator, freezer, or cooler shall be prominently marked indicating whether or not it meets the requirement for safe storage of flammable liquids. Refrigerators, freezers, and other cooling equipment used to store or cool flammable liquids shall be designed or modified as follows:

a. Any electrical equipment located within the outer shell, within the storage compartment, on the door, or on the door frame shall meet the requirements for Class I, Division I locations, as described in the latest edition of Article 501 or NFPA 70 (NEC).

b. Electrical equipment mounted on the outside of the storage compartment shall either:

1. meet the requirements for Class I, Division 2 locations or,
2. be installed above the storage compartment, or
3. be installed on the outside surface of the equipment where exposed to hazardous concentrations of vapors will be minimal.

**7-9.10.** Laboratory rooms or storage buildings containing chemical agents shall have chemical symbols posted on the outside of the building as well as the individual laboratory room. Chemical symbols shall be posted on the street side of the building. If the approach to the building can be reached two separate ways, then additional chemical symbols must be installed on each street approach side.

**7-9.11.** Chemical, toxic and other hazardous laboratories shall have a laboratory notice (EAP Form 106) card posted on all laboratory doors with all information completed to prevent unauthorized entry that could result in bodily harm or the interruption of a laboratory experiment that is in process. The laboratory notice card shall indicate whether the room may/may not be entered without protective equipment or clothing.

**7-9.12.** Rooms containing radioactive material shall be posted with the appropriate warning signs on each door leading into the area.

**7-9.13.** The quantity of flammable liquids in laboratories will be kept to an absolute minimum (usually only one day's supply). All other flammable liquids shall be stored in an approved flammable liquid cabinet.

**7-9.14.** Hazardous chemicals stored in the open in the laboratory work area shall be kept to the minimum necessary for the work. All other chemicals shall be stored in a approved chemical storage cabinet or stored in a chemical storage room. Chemical storage cabinets in laboratories do not have to be vented for fire protection purposes.

**7-9.15.** Incompatible materials shall be segregated to prevent accidental contact with one another.

**7-9.16.** Containers of materials that might become hazardous upon prolong storage shall be dated when first opened. At the end of 6 months, the material shall be evaluated or tested for continued safe use. Material found to be safe or that can be treated to make it safe shall be permitted to be redated and retained for an additional 6 month period. All other material shall be safely discarded.

**7-9.17.** Perchloric acid that has not been diluted and heated above ambient temperatures shall only be used in a laboratory hood specifically designed for its use and identified as "FOR PERCHLORIC ACID OPERATIONS." Perchloric acid hoods shall be installed and designed in accordance with the latest edition of NFPA 45.

**7-9.18.** Special use laboratory hoods shall be identified to indicate their intended use. A sign shall be affixed to each hood containing the following information from the last inspection.

- a. inspection intervals
- b. last inspection date
- c. average air velocity
- d. the working capacity of the hood in cubic feet
- e. location of fan that serves the hood
- f. the overall condition of the hood
- g. possible uses of hood (flammable, acids, chemical-biological)
- h. The name and telephone number of the inspector

**7-9.19.** A list of chemicals, the quantity, and a copy of the Material Safety Data Sheet (MSDS) shall be sent to the fire department. A person in charge of the laboratory shall be responsible for maintaining a current list of all chemicals and shall forward the information to the fire department as the chemical inventory changes.

**7-9.20.** Emergency plans for laboratory emergencies shall be developed and placed in each laboratory. The plan shall include:

- a. alarm activation;
- b. evacuation and building reentry procedures;
- c. equipment shutdown procedures or applicable emergency operation;
- d. fire-fighting operations, location of portable fire extinguishers, and
- e. non fire hazards.

## **7-10. LIQUIDFIED PETROLEUM GASES (LPG)**

**7-10.1.** Storage, handling, use, transportation and the installation of equipment and

appliances for the use of liquidified petroleum gases shall conform with nationally recognized codes and standards, as well as regulations referenced herein.

**7-10.2.** All contractors delivering liquidified petroleum gases on the installation shall provide the fire department with emergency telephone numbers to provide 24 hours notification. The contractor will provide 24-hour emergency service when requested to pump out containers or repair leaking cylinders when requested by the fire department or representatives of DIO.

**7-10.3.** Containers that show serious denting, bulging, gouging or excessive corrosion shall be removed off the installation by the vender of the container.

**7-10.4.** Repair or alteration of containers and associated equipment shall comply with this regulation, the latest edition of NFPA 58, and the manufacturer's guidelines and specification.

**7-10.5.** Regulators and low pressure-relief devices will be rigidly attached to the cylinder valves, cylinders, supporting brackets, the building wall or other recognized method of securing regulator and pressure relief devices.

**7-10.6.** A hood or cover shall be installed to protect the regulator and relief valves from the inclement weather such as sleet or snow. Such weather conditions will affect the operations of the regulator and relief valves.

**7-10.7.** A shutoff valve shall be located in the supply line outside of the building and will be protected from inclement weather.

**7-10.8.** All valves, connectors, manifold valves, assemblies and regulators shall be listed for use with LPG and shall be approved by a nationally recognized testing laboratory for such use.

**7-10.9.** All LPG containers shall be placed on a firm, level foundation, preferably concrete, firmly secured. Outlet piping will be protected from physical damage.

**7-10.10.** Cylinders installed alongside of buildings shall be located and installed so that the discharge from the cylinder pressure relief device is at least 3 feet horizontally away from any building openings (windows and doors) that is below the level of such discharge.

**7-10.11.** All cylinders shall be marked "LP-Gas." A warning label shall be applied to all cylinders of 100 lb LP-gas capacity or less not filled on site. The label shall include information on the potential hazards of LP-Gas. The water capacity of the cylinder in pounds shall be marked on the cylinder. All horizontal, above-ground LPG tanks shall be marked with two and one-half inch letters as follows: **LP GAS, NO SMOKING WITHIN 50 FEET**. A marker post of 30 inches high and 4 inches square or in diameter will be installed as close as possible to the shutoff valves and manhole covers of underground tanks. The marker shall read: **LP GAS VALVE**. Valves and manholes will be accessible at all times.

**7-10.12.** All pipes, fittings for pipes and tubing shall be used and installed in accordance

with the latest edition of NFPA 58. Pipe joints in wrought iron, copper, steel, brass, or copper pipe shall be permitted to be screwed, welded, or brazed.

**7-10.13.** Storage of LP cylinders within residential buildings, including the basement or any storage area in a common basement storage area in multiple family dwellings and attached garages, shall be limited to two cylinders each with a maximum water capacity of 2.7 pounds (nominal one pound LPG) and shall not exceed 5.4 pounds total water capacity for smaller cylinders per each living space unit. The storage of 20-pound LP-Gas, 5 gallon water capacity cylinders used for barbecue grills is prohibited in any dwelling unit.

**7-10.14.** No container of LPG larger than a water capacity of 2.5 pounds (nominal one pound LPG) may be stored in any building unless the building has been specifically approved for such storage by the fire department. The LP-gas cylinders used as self-contained hand held torches or used for experiments shall be permitted to be stored or displayed in any building that is frequented by the public.

**7-10.15.** In storage and industrial occupancies, the maximum quantity in one storage location shall not exceed 300 pounds (normally 3-100 lb LPG cylinders). If additional storage is required within the same building, the cylinders shall be separated by minimum 300 feet or be placed in another fire area divided by a rated wall.

**7-10.16.** Storage outside of buildings for cylinders awaiting use, resale, or part of a cylinder exchange point shall be located at least 20 feet from any doorway or in a building frequented by the public, and 20 feet from any automotive service station fuel dispenser. Cylinders shall be placed on a firm, level foundation, preferably concrete, firmly secured.

**7-10.17.** Cylinder valves shall be protected by a screw-on-type cap or collar and shall be securely in place on all cylinders stored, regardless if they are full, partially full, or empty; and cylinder outlet valves shall be closed and plugged or capped.

**7-10.18** Personnel detecting an odor of LPG gas or suspecting a gas leak will dial (911) and report the leak. In the event of fire involving LPG, every effort should be made to shut off the gas supply. If the fire is extinguished and the gas is allowed to escape, it will flow to low spots and form gaseous pools. Every effort will be made to keep personnel out of this area. Any ignition source could cause a violent explosion.

**(AMSSB-GSH-F)**

**FOR THE COMMANDER:**

**DAVID G. BURDICK**  
**Adjutant General**

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